ENVIRONMENTAL PERCEPTION AND THE HISTORICAL GEOGRAPHY OF THE GREAT AMERICAN WETLAND: FLORIDA'S EVERGLADES, 1895 TO 1930

By

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ENVIRONMENTAL PERCEPTION AND THE HISTORICAL GEOGRAPHY OF THE GREAT AMERICAN WETLAND: FLORIDA'S EVERGLADES, 1895 TO 1930

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The debate regarding land use in Florida's Everglades is one of the leading issues on the environmental agenda of the 1990s. Indeed, their size, proximity to a major population concentration, and mystique justify the title "Great American Wetland." In spite of all the technical literature on the "Glades," nobody fully understands this ecosystem. Unfortunately, we know much less about humanity's historic relationship with the Everglades.

This study is an examination of people's perception of the Glades from the late 19th century to 1930. Politicians engaged in a tremendous effort to drain South Florida's interior wetlands during this period, and it is commonly assumed that most people of the time heartily endorsed Everglades reclamation. Yet evidence presented in this study suggests that many people questioned Florida's drainage program.

The physical geography of the late 19th and early 20th century Everglades is reconstructed using climate data, soil surveys, topographic maps, historical photographs, and literature from early 20th century botanists who explored the region. Next, archival materials such as government documents, travel accounts, newspapers, and promotional material from early 20th century Everglades real estate companies are used to piece together past perceptions of the Glades. These sources of information are used in conjunction with correspondence from the papers of Thomas Will, an early Everglades settler and promoter. Will's large collection of papers is important because he communicated with a variety of people: pioneers, government officials, residents of Florida's southeast coast, and northern investors in Everglades property.

Finally, it is suggested that the Everglades and other wetlands are part of a larger category of "flatlands" that have been vulnerable to over-development. On one hand, mountainous areas are clearly vulnerable to development pressure because development can cause severe soil erosion. On the other hand, the threat to wetlands and many other flatlands is more subtle, and this causes people to overlook their vulnerability to development pressure.

CHAPTER 1
INTRODUCTION

Wetland protection and regulation is perhaps the most celebrated and ubiquitous environmental issue of the 1990s. Unfortunately, it is among the most misunderstood. Much of this misunderstanding stems from shifting perceptions of wetlands. Wetlands have almost always been poorly understood by the public and have been almost universally condemned throughout United States history. Indeed, malaria was previously thought to be caused by bad air supposedly associated with such places (Thompson 1976). Many people still attach negative connotations to the words swamp, marsh, and bog. Past perceptions of wetlands as strange, exotic, and useless strongly influenced their settlement and subsequent utilization.

There are no comprehensive historical geographies of American wetlands, nor of that Great American Wetland, Florida's Everglades. Of all the famous wetland systems across the United States--like the North Carolina-Virginia border's Dismal Swamp, Georgia's Okeefenokee Swamp, or Louisiana's bayous--Florida's Everglades (or "Glades") are perhaps most deserving of the label Great American Wetland. Size, proximity to a major population concentration, and popular image certainly make the Glades a contender for such a title. Furthermore, what happens to this extensive area of wetlands next to a densely settled portion of the country's fourth most populous state is likely to have a profound effect on similar areas throughout the nation (Figure 1).

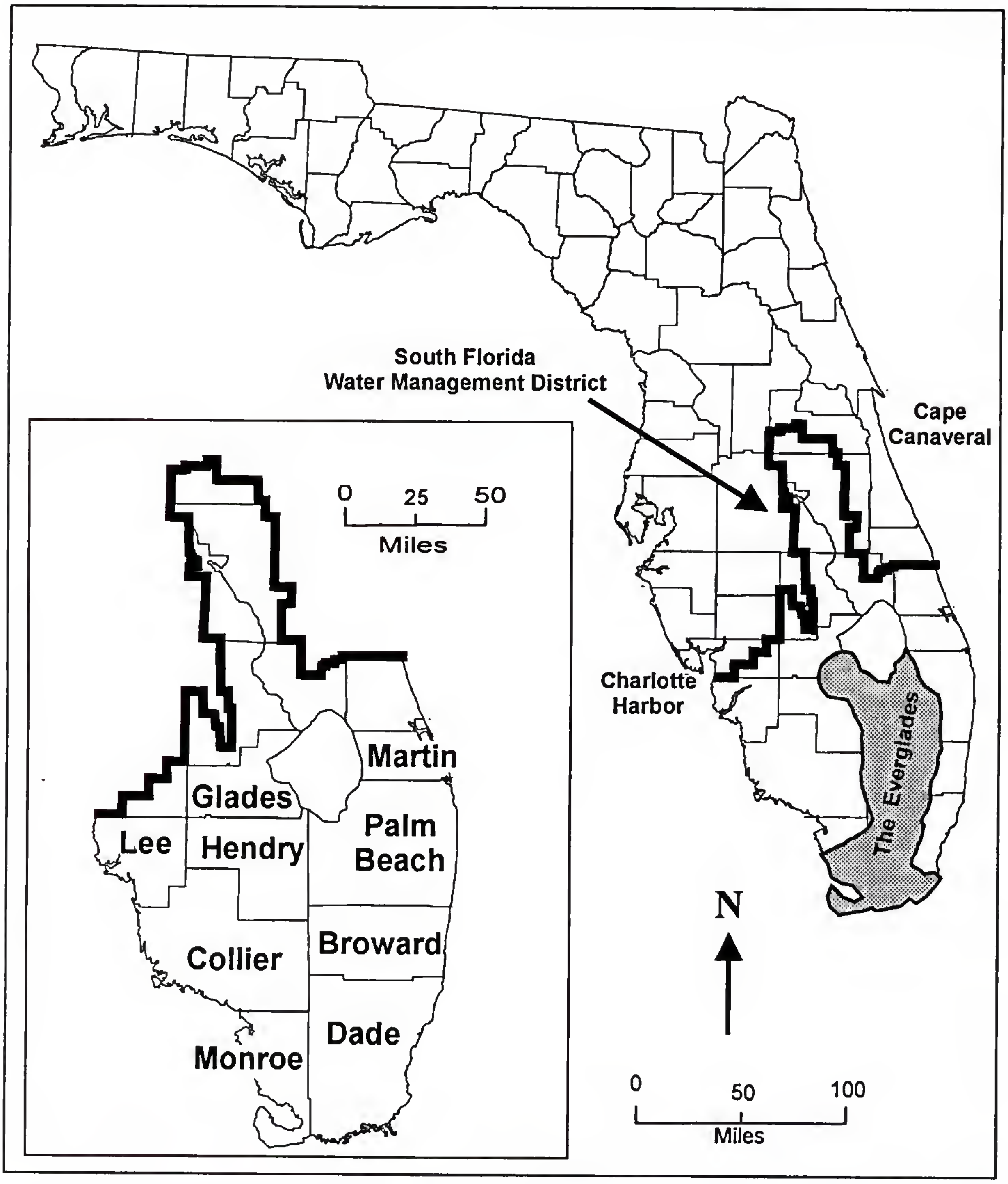

Figure 1. Maps of Florida, the South Florida Water Management District, and the Everglades.

Although there is a plethora of literature on the Everglades; much of it focuses on technical issues such as water quality or hydroperiod management. While these issues are important, such literature does not deal with shifting perceptions of the Glades during the late 19th and early 20th century, a period of tremendous population growth and land use change. These shifts in perceptions have significantly influenced both agricultural and urban development in South Florida. Society's views of the Everglades are partially a function of how much people know about them. Although our knowledge base of the Glades has mounted steadily since the late 19th century, nobody fully understands all of the subtleties of this complex ecosystem. People's perceptions of the Glades are also a function of values. Accordingly, resolving controversies in the Great American Wetland, such as pollution from agricultural runoff and urban expansion into the Everglades, are not likely until we develop some sense of our historic relationship with this environment.

Why are wetlands valuable? To begin with, many wetlands are excellent providers of flood control. In the early 1970s, the U.S. Army Corps of Engineers found that it would be less expensive to purchase wetlands outside Boston, Massachusetts, than to build additional flood control structures along the Charles River (Doyle 1986). Coastal wetlands, which used to ring much of South Florida, not only lessen the impact of storm surges, they protect more inland locations from the impact of wave energy during storms (Chabreck 1988). It is widely recognized that some wetlands recharge groundwater aquifers that are tapped by municipal water systems (Stone and Stone 1994). Central Florida's Green Swamp and parts of South Florida's Everglades are particularly noteworthy in that regard (Brown 1984; Schroeder, Klein, and Hoy 1958). Furthermore, wetlands are known for their ability to improve water quality. They help purify water by allowing suspended sediments to settle and by converting some chemicals and nutrients into organic matter (Phillips 1989). This attribute has attracted the attention of several researchers who suggest that under the right conditions, wetlands can be used to provide wastewater treatment (Best 1994; Fritz and Helle 1984). Indeed, scientists are conducting experiments in the Everglades to determine the feasibility of constructing several "filter marshes" to help clean agricultural runoff before it enters the water conservation areas, Big Cypress Swamp or Everglades National Park (Figure 2). The Clinton administration endorses this idea and has called for increased taxes upon sugar to pay for the purchase of land to be used as a filtering marsh (*Daytona Beach News-Journal* 1996).

Wetlands are also rich in biological resources. The Everglades are widely regarded as one of the nation's first biological national parks. Many wetlands serve as habitat for commercially significant and endangered plants and animals (Boesch and Turner 1984; Williams and Dodd 1979). For example, ecologists estimate that over 95% of this country's commercially harvested fish and shellfish species are wetland dependent (Mitsch and Gosselink 1993). In South Florida, there is speculation that the health of Florida Bay-- and the associated recreational and commercial fishing industries around the Florida Keys-- is linked to the quality of water flowing down from the Everglades (*New York Times* 1995; *Gainesville Sun* 1994). Furthermore, wetland hunting and trapping activities pump millions of dollars into the economy every year (Davis 1983 and 1978). A substantial percentage of the nation's annual timber harvest comes from forested wetlands (Johnson 1979).

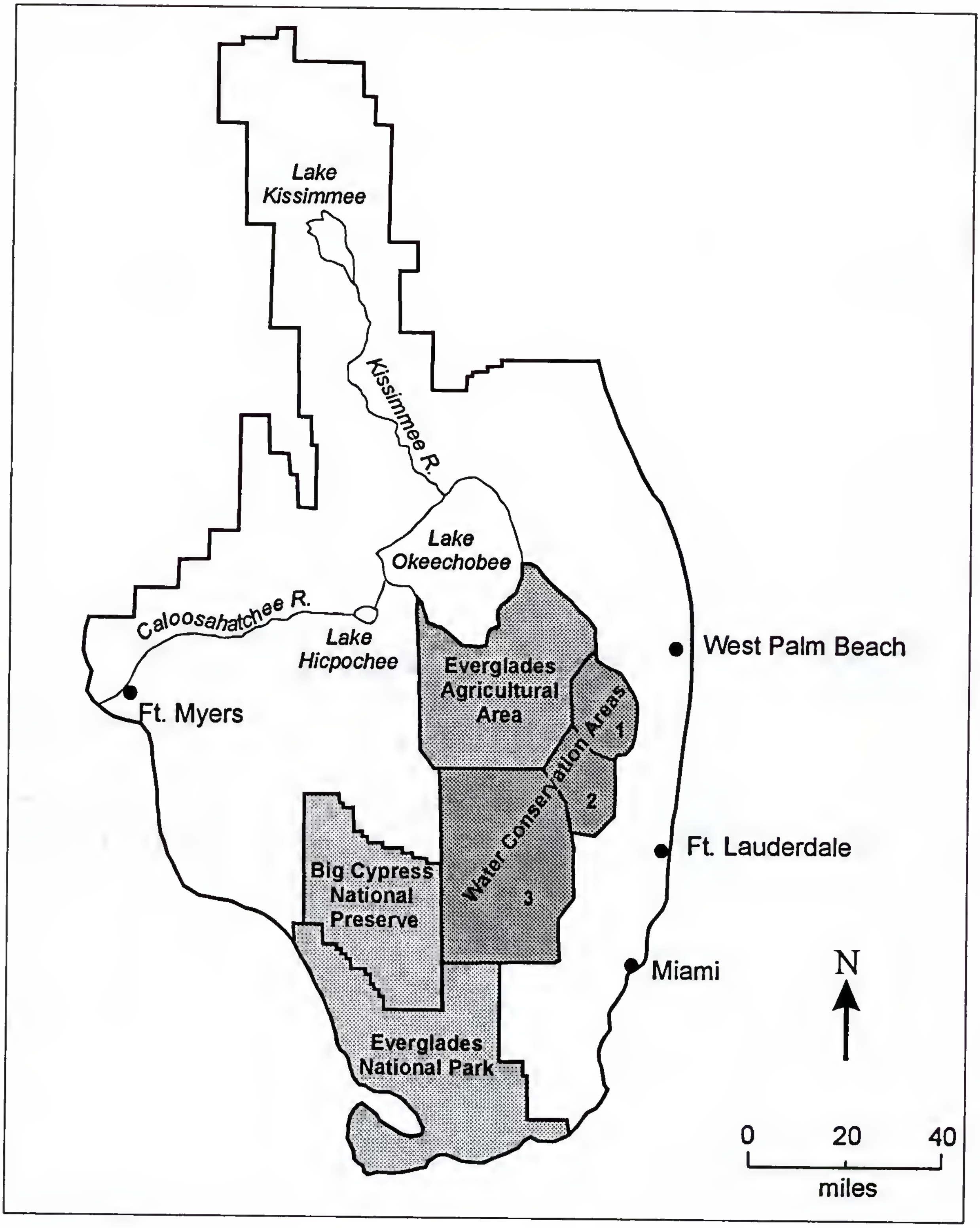

Figure 2. Everglades National Park, and other administrative areas in South Florida

Finally, there is growing recognition of education, recreation, and aesthetic values of wetlands (Williams 1991; Niering 1986; Bardecki 1984; Reimold and Hardisky 1979). Because wetlands naturally retard the decomposition of organic matter and other artifacts, even archaeologists have discovered their value (Coles 1990). For instance, Sears (1982) found archeological evidence of habitation in the northern Glades at least as early as 3,000 years before the present. Smardon (1979 p.542) argues that "unless we look at the regional landscape in context, we may slowly lose major ingredients in the character of the landscape without even knowing it." All of this stands in marked contrast to traditional perceptions of wetlands as mysterious, foul smelling, insect ridden, waste lands (Benhart and Margin 1994). As this information disseminates further and improves perceptions of wetlands, government agencies will probably face mounting pressure to protect these environments.

Recent controversy surrounding the Everglades is linked to the nationwide problem of wetland loss. The standard American response to wetlands has been drainage, converting them into the more familiar landscape of mid-latitude agricultural lands. Indeed, Dahl and Johnson (1991) confirm that a majority of wetland losses have been due to drainage for agricultural purposes. In many cases, drained wetlands can be returned to their original wetland condition. Conversely, coastal wetlands--particularly those in southern Louisiana--can be lost to sea level rise, which can last for thousands of years. Estimating the extent of wetland loss is extremely difficult. In order to determine how much wetland acreage has been lost, one must first determine how much wetland acreage once existed. There have been at least five attempts at the national level to estimate the wetland base of the contiguous 48 states around the year 1780. Although each attempt relied on a different methodology, all of the studies yielded an estimate between 211 million and 221 million acres (Dahl 1990).

Dahl (1990) concludes that the United States (excluding Alaska) had 104 million acres of wetlands in the 1980s, a reduction of over 50% since colonial times. It should be noted, however, that wetland losses have been unequally distributed across the country (Dahl 1990). New Hampshire has lost only 9% of its original wetland base, while Georgia, South Carolina, and Montana have lost just a quarter of their wetlands. On the other hand, California, Indiana, Illinois, and Ohio have each lost at least 85% of their wetlands. Florida has more closely approached the national average with a 46% reduction of wetlands since the 1780s. Further complicating matters is the fact that some states have larger endowments of wetlands and many of these have lost significant wetland acreage (Dahl 1990). For example, Texas, Arkansas, Illinois, and Louisiana have each lost between seven and eight million acres of wetlands and Florida leads the nation with over nine million acres of wetlands lost.

Like Louisiana, more than half of Florida's surface area was considered wetland in the 18th century. Despite significant drainage activities in Florida over the past 100 years, nearly 30% of Florida's surface area remains wetland (Dahl 1990). Hefner (1986) estimated that not quite 13 of Florida's original 20 million acres of wetlands remained by the mid 1950s, and Frayer and Hefner (1991) maintain that Florida had just over 11 million acres in the mid 1980s. Although Frayer and Hefner maintain that the average annual wetland loss in Florida has been significantly reduced in recent years, a large percentage of Florida's wetlands have been altered, especially in South Florida. These authors contend that the Everglades have been reduced 65%. Indeed, Kushlan (1987) argues that only six percent of the original marsh is in Everglades National Park.

The purpose of this dissertation is to detect and analyze past perceptions of Florida's Everglades, and investigate their impact on settlement and land use in South Florida during the years 1895 to 1930. During this time people made a tremendous effort to change the Great American Wetland. The period begins in the late 19th century, immediately after a severe cold spell induced Henry M. Flagler to extend his Florida East Coast Railroad from West Palm Beach to Miami. It ends in 1930, in the aftermath of two hurricanes--which killed nearly 2,200 people in the region--prompting Florida to beg the U.S. Army Corps of Engineers for a protective levee around Lake Okeechobee.

Chapter 2 of this dissertation begins with a review of literature that provides a foundation for the study. Although historical geography is one of the oldest branches of geography, relatively few practitioners have ventured into wetlands. Even so, there are some examples of wetland historical geography worth noting. Following this will be a review of literature dealing with two closely related themes that frequently appear in historical geographic work. First is the established tradition of human-environment interaction. Geographers have long investigated humanity's use of natural resources. Even historians have adopted this theme with significant work in environmental history. A second, and closely related, theme is that of environmental perception. People's views of their environment significantly influence how they use (or abuse) land. Obviously, human modification of the Everglades has become a major issue. After reviewing literature on these two themes, a section is devoted to summarizing human activity in the Everglades from pre-Columbian times to the late 1800s. Finally, the last section of the literature review provides a conceptual framework and methodology for the study.

Chapter 3 is a reconstruction of early 20th century Everglades physical geography: climate, vegetation, soils, and geology. It is important to have some sense of what the Glades were like before they were significantly altered. Chapters 4 and 5 contain reconstructed images of the Everglades as maintained in the minds of late 19th and early 20th century people. This is an important time period because it is during this era that some people began to look at the Glades as something other than a watery wasteland. Chapter 6 is an attempt to produce an abstract model of people's view of flatlands--wet and dry. Understanding this view, and how it came about, is crucial to understanding how the Everglades have become what they are today. Chapter 7 consists of a summary, some conclusions, and suggestions for future research.

CHAPTER 2
LITERATURE REVIEW

Although an army of scientists has invaded the Glades in an effort to discover the physical processes behind South Florida's environmental problems, many Everglades authors make only cursory mention of the region's historical geography. In this chapter a variety of literature is brought together in an effort to highlight some important themes in the story of humanity's historic relationship with the Everglades. Major parts of this chapter include (1) a discussion of differences between history and historical geography (with special reference to Florida) including examples of the views of historical geographers; (2) an examination of some ideas regarding human-environment interaction; (3) tracing the development and use of environmental perception in geography--especially as used by historical geographers; (4) a review of historical geographic literature on wetlands; (5) brief overview of human habitation in the Glades from prehistoric times to the late 19th century; and (6) a discussion of the study's conceptual framework, methodology, and data sources.

History and Historical Geography

Perhaps the most important difference between historians and historical geographers is the role of place in their studies. Many historians view place as the setting in which history operates. After examining setting, however, historians have traditionally given more attention to the activities of society's decision makers. Histories of Florida's Everglades provide a case in point (Dovell 1947; Alfred and Kathryn Hanna 1948; Blake 1980). They provide excellent descriptions of explorers' accounts of the region, government action regarding the Glades, and settlers' activities. Yet, the importance of place and people's perceptions of place are usually beyond the scope of such work. Historical geographer Donald Meinig contends that such studies, although valuable, are somewhat incomplete. He maintains (1989 p.84) that places are important and that "an understanding of places and regions requires historical understanding, not as a preface, not as a bit of background, not as a few paragraphs sprinkled through a text, but as an integral thoroughly researched and thoughtful study" of how places came to be what they are. In short, places are important because each place provides a set of opportunities and limitations for all forms of life. Furthermore, people's perceptions of places help determine land use--an important issue in the Everglades.

Historical geographers Baker et al. (1969) contend that the past should be reappraised in terms of present thinking, present problems, and present needs. They argue that in order to develop the historical geography of any place, one must begin by conducting a thorough search of the contemporary landscape. Only after exploring the contemporary scene can one begin to understand the past. Baker et al. (1969 p.49) believe that past situations should be examined "in light of the attitudes and objectives of past societies and individuals and the extent to which those objectives were realized." Nowhere is this more true than in Florida's Everglades, where hydrologic problems caused by previous activities in the region have led to an overhaul of our thinking toward the Glades.

Relatively few geographers have studied U.S. history from a geographical perspective. In his presidential address at the annual meeting of the Association of American Geographers in 1940, Sauer complained that "a peculiarity of our American geographical tradition has been its inherent lack of interest in historical processes and sequences, even their outright rejection" (Sauer 1969, p.352). In 1948, Brown produced the first comprehensive historical geography of the United States. This volume includes relatively little material on Florida, the author's discussion of the state being limited to the Spanish period. Mitchell and Groves (1987) edited a more recent volume on U.S. historical geography and, like Brown's work, its focus is on activities in Florida prior to the Civil War. Indeed, there is relatively little historical geographic literature on Florida, and even less on South Florida, let alone the Everglades, as evidenced in Conzen et al. (1993). This probably stems from the fact that Florida, particularly the southern half of the state, remained an area of modest population until World War II. In addition, most historical geographers are not accustomed to working on the recent past.

In many cases, historical geography focuses on the relationship between people and their environment. This dissertation is an examination of past perceptions of the Everglades; such a study sheds light on why and how people chose to transform their environment. Meinig provided a good example of such work early in his career. In 1954 he wrote an article entitled "The Evolution of Understanding an Environment: Climate and Wheat Culture in the Columbia Plateau," in which he examined an environment that initially confounded middle 19th century settlers. He traced the evolution of environmental understanding that took place in the region. Most turn of the century pioneers were baffled by the Everglades, and scholars are still far from fully understanding this environment. Meinig concludes that "reconstruction of climates of opinion and the reconstruction of the material features and functional patterns of the past are interdependent and must proceed together in the mature pursuit of historical geography" (p.31). Because no one seems to have documented the evolution of our understanding of Florida's Everglades, Meinig's work is a fine example of the kind of research that is needed about the Glades.

Human-Environment Interaction

American historical geographers have not contributed heavily to the literature on environmental history (McQuillan 1995). The relatively recent development of environmental history as a field of study prompted Williams (1994) to comment on the close links between historical geography and environmental history. He suggests that practitioners of each would do well to consider each other's work. Indeed, there are a growing number of historians studying environmental history (White 1985). For instance, Worster (1993) argues that some writers have correctly identified America's demographic explosion, rapid advances in technology, and relatively recent development of energy resources as keys to understanding the human transformation of the United States. But he contends (p.8) that we should probe "the immigrant white man's culture, his and her ideas or ways of seeing" in order to more fully understand the profound sources of environmental change. These are certainly issues that historical geographers are particularly well suited to tackle.

Exploring the relationship of people with their environment in 1925, Sauer attacked environmental determinism--the notion that a region's physical geography dictates the cultural geography of an environment. He forcefully argued that landscapes are produced from the interrelationship between physical and cultural factors, insisting that people "are the most important morphological factor" (p.341).

In 1983, Cronon analyzed changes in the colonial New England landscape, ostensibly brought about by invading Europeans. Colonists to the region could not imagine how a land that appeared so rich could be inhabited by people who appeared so poor. Cronon maintains that "Indian communities had learned to exploit the seasonal diversity of their environment by practicing mobility" (p.37). He also noticed that natives endured relative scarcity during the winter. By consuming animals when they were most plentiful, Indians never over-used any species.

Like Native Americans in many places, New England Indians viewed property as something to use rather than to own and hold. When Indians "sold" lands, they probably never intended to give up hunting and other land use rights. Also, English colonists brought with them a desire for a more settled lifestyle, which required a more concentrated use of their environment. Consequently, as Cronon maintains, "it was the treatment of land and property as commodities traded at market that distinguished English conceptions of ownership from Indian ones" (p.75). Furthermore, trade began to link Indians with colonists and Europeans, and as Indians became increasingly involved with European trade (by producing large numbers of animal skins and meat), this reduced the Indians' ability to sustain themselves.

Colonial era deforestation, overgrazing, and plowing all led to soil exhaustion and disastrous watershed problems throughout settled New England. Cronon observes that "colonial farmers treated their land as a resource to be mined until it was exhausted, rather than one to be conserved for less intense but more perennial use" (p.152-3). Although Cronon maintains from the outset that Indians modified their landscape (largely through the use of fire) long before Europeans arrived, English concepts of land use brought further, more devastating changes to New England.

Hirt (1989) examined the relationship between culture and ecological change, noting radical transformation of the landscape as pioneers replaced Native Americans in southeastern Arizona over a century ago. On one hand, the region's natives viewed plants and animals as vitally important parts of their landscape. On the other hand, invading Americans saw natural resources as raw material for the production of wealth. The resulting transformation of southeastern Arizona, Hirt maintains, "can be described as an ecological response to the particular institutions, ideologies, and modes of production of the intruding Anglo-American society" (p.168). He contends that these changes offer an opportunity for social critique. Hirt concludes that "the Anglo-American value system, powered by potent technologies, supported by an expanding capitalist economy, buttressed by public policies endorsing unsustainable consumption of natural resources, created an environmental crisis in the late nineteenth century, the legacy of which remains today" (p.183).

Sauer could easily have been discussing South Florida when he noted (1969 p.372) that "the forms of dissipation of natural capital are many, their causes cultural, their results are slow crises in the affected areas." American culture has traditionally insisted that land be put to "productive use" and, until recently, productive use almost always meant transforming available natural resources into goods and services for humankind. In South Florida, pursuit of productive land use has come at the cost of substantially reducing entire species of plants and animals and rapidly depleting peat soils; moreover, it is even suggested that otherwise productive neighboring ecosystems like Florida Bay have suffered as a result of fertilizers used in the name of making the Everglades "productive" (Bodo 1995).

White (1967) suggests that religion plays a powerful role in guiding a society's relationship with the land. He accuses Christianity of insisting that all creation exists for no other purpose than to serve humankind, and blames this attitude for severe environmental degradation. White asserts that "both our present science and our present technology are so tinctured with orthodox Christian arrogance toward nature that no solution for our ecologic crisis can be expected from them alone" (p.1207). He concludes that most Americans should either find a new religion or re-think their existing one.

Henry David Thoreau's transcendentalism of the mid 19th century appealed only to a few, and most people ignored George Perkins Marsh who "disputed not the desirability of conquering nature but the bungling way it was being done" (Lowenthal 1990 p.129). Marsh used a combination of economic arguments and rudimentary science in an attempt to demonstrate humanity's negative impact upon the landscape. Despite humanity's assault on the landscape, however, plenty of wilderness remained--and wilderness was the enemy. As Nash (1967 p.43) points out, "prejudice against wilderness had the strength of centuries behind it and continued to influence American opinion long after pioneering conditions disappeared." At the close of the 19th century, however--with the frontier declared closed--some began to question long-held beliefs in "progress." John Muir led an increasingly vocal group of conservationists who called for the preservation of America's rapidly disappearing wilderness. Muir and his faction were opposed by Gifford Pinchot and other advocates of a utilitarian definition of conservation that rejected wilderness preservation in favor of more efficient use of all natural resources. Many early 20th century conservationists, especially those who favored "wise use of all resources," would not be considered "conservationists" today--because modern use of the term usually implies a substantial element of preservation. Although a small part of Everglades National Park eventually earned designation as a wilderness area, there is widespread concern that agricultural use of part of the original Glades may cause problems not only for the small remaining tract of wilderness, but also for neighboring environments and urban populations.

The undeveloped Everglades of the early 20th century were frequently referred to as a potential garden. Leo Marx (1964 p.43) contends that "to depict America as a garden is to express aspirations still considered utopian--aspirations, that is, toward abundance, leisure, freedom, and a greater harmony of existence." Everglades reclamation became synonymous with progress. Yet it soon became difficult to identify where progress ended and trouble began. Still, Marx contends that the garden metaphor "enabled the nation to continue defining its purpose as the pursuit of rural happiness while devoting itself to productivity, wealth, and power" (p.226).

In the 1950s, Sauer helped organize a multi-disciplinary symposium entitled "Man's Role in Changing the Face of the Earth." He questioned the role of cities on surrounding landscapes, noting that in the late 19th and early 20th centuries, "food and feed were cheap in and about the centers of industry, partly because the fertility of new lands of the world was exported to them without reckoning the maintenance of resource" (p.66). South Florida's sugar production, intended for markets across the nation, is representative of his concern. Sauer was hardly consoled by the fact that in later years, society shifted to "easy confidence in the capacities of technological advance" (p.66). He concluded that "our output has been secured at unconsidered costs and risks by the objective of immediate profit, which has replaced the older attitudes of living with the land" (p.67). Yet the symposium featured few other pessimists. Lowenthal (1990 p.125) asserts that "to most of those at *Man's Role* environmental impact seemed a matter of major concern only to scientific ignoramuses or crackpots."

Lowenthal (1990) contends that many American pioneers sincerely believed that the more profoundly they manipulated nature, the more fertile and productive it seemed to become. But even if people become aware of their impacts on the environment, awareness does not always translate into lifestyle adjustments or political agendas. Furthermore, many people still argue that private property rights reign supreme over collective concern for the environment. Lowenthal concludes that, often, only disaster achieves immediate remedial action.

Finally, Sack (1990 p.659) asserts that "an understanding of human transformation of nature involves understanding not only what we are doing to affect nature, but also why we are doing it." He suggests that as mass consumption becomes more and more accepted, our daily lives become more powerful agents in the transformation of nature. This is because mass produced products require the extraction of tremendous amounts of raw materials, development of much infrastructure, and disposal of large amounts of waste products. Continuing, Sack argues that advertising disguises the resulting environmental transformation by allowing people to disassociate themselves from the consequences of their actions. Bennet and Dahlberg (1990) add that we must find ways to exclude various life-supporting systems from the economic calculus. They would argue, for example, that since wetlands provide many life-support functions--like food, lumber, and water purification--they should be not be treated like other commodities.

Environmental Perception

The relationship between people's perception of their environment and their behavior is of fundamental importance in this study. It is crucial in developing an understanding of why people systematically altered the Everglades. It is worthless to assume that environmental problems in South Florida are solely the responsibility of a few corporate farmers who believe they have a right to make money from their land. A more complete analysis requires a thorough examination of the perceptions of late 19th and 20th century people--the people who began the process of change in the Glades.

Environmental perception is a relatively recent addition to the geographical milieu. In 1925, Wright asked how geographers could avoid considering society's thoughts regarding the environment. He recognized that studying geographical perception is much more difficult than mere geographical description. Yet Wright maintained (p.198) that "it is the human mind itself and not the geographical feature which creates the idea within the mind." Therefore, understanding what people think of their environment is a key to understanding why people modify their environment. He compared the mind's image of the earth to a mirror. "These images have been distorted and discolored by the quality of minds in which they have been lodged; they have been blurred by accumulations of extraneous lore in these minds and confused by other thoughts" (p.201). Unfortunately Wright was ignored. He issued his call again in late 1946 as president of the Association of American Geographers with an address entitled "Terrae Incognitae: The Place of the Imagination in Geography" (Wright 1947). Again, no response.

In 1961, Lowenthal (Wright's protege) renewed the call for an understanding of the relationship between the outside world and the pictures in our heads. His article marks the beginning of the modern era in environmental perception. Indeed, *Progress in Human Geography* (1994) lauded Lowenthal's 1961 study as a "classic in human geography." Like his mentor Wright, he insists that "the surface of the earth is shaped for each person by refraction through cultural and personal lenses of custom and fancy" (Lowenthal 1961, p.260). Moreover, in reaction to the developing quantitative revolution in geography and its emphasis on "describing things as they are," Lowenthal contends that what people believe is equally important. Geographers suddenly began exploring the connection between people's beliefs and their behavior.

The 1960s witnessed a burst of scholarship focusing on environmental perception. Some began to examine relationships between hazardous environments and behavior (as summarized by the work of Burton, Kates and White 1993); others delved into psychology to explore mental maps and cognition (Downs 1981; Golledge 1987); still others have studied the sources of the bond between people and places (Tuan 1974). Rather than become a focused subdiscipline of geography, however, a wide variety of geographers began to engage in perception studies. In terms of this dissertation, the most important perception studies are those that use environmental perception in historical geography. Accordingly, what follows is a review of some historical geographies that use environmental perception.

In an analysis of images and image makers in colonial South Carolina, Merrens (1969) examined five different types of source material. Although certainly not exhaustive, this list is a good place to begin putting together past perceptions of any environment. To begin with, early promotional material provides a crude glimpse of society's image of a landscape as settlement begins. It is likely to contain much exaggeration but provides can some clue as to an incoming people's hopes and desires for a place. Second, official reports may also provide information. Depending on the official's stake in the settlement, one might find various degrees of selective reporting. In any case, such reports are likely to contain more data than promotional material. Next, accounts of travelers may exist. Inasmuch as authors of these are not likely to be very familiar with the places they visit, they might be more superficial accounts. On the other hand, visitors may also "see" things that natives do not. Fourth, natural historians may be important sources of environmental data if not keen observers of economic and social conditions. Finally, settlers may provide excellent descriptions of conditions. Unfortunately in many cases, they are also the least likely to write of their experiences and observations. To this list might be added (among others) editorials and newspaper articles, periodicals and schoolbooks of the era.

Bowden (1976, 1975, 1971, 1969) also made extensive use of environmental perception in his historical geographic work. He argues that popular perceptions of the American Great Plains have shifted periodically since the 19th Century, but the notion of the Plains as Great American Desert was never as widespread as many have assumed. According to Bowden, these shifts have been as much the result of a highly variable climate as to changing preconceptions (and misconceptions) of prominent historians. Of turn of the century historians, Bowden (1976 p.126) insists "it was they who authenticated the desert as history and made it into a contemporary myth."

Bowden later argued (1992) that the Great American Desert was one of many traditions invented by people who wanted to prove that their conquest of a pristine wilderness marked their success as a nation. Moreover, myths about the Great Plains served the same purpose as a host of other myths regarding American's struggle with their environment. Pioneers throughout United States history, Bowden maintains, have produced a "succession of imagined environments which have been conceived as far more difficult for the settlers to conquer than they ever were in reality" (1992 p.20).

Watson (1969) argues that society's view of an environment's potential leads people to discover positive aspects about the place and to ignore negative aspects. "What happens," he contends, "is that we create a pattern of culture which defines what we want from and see in the country, and then we try to develop the country of our wants" (p.15). Early Everglades boomers boasted of the region's fertile soil while they ignored the complexity and consequences of draining the Great American Wetland. Several years later, Watson (1976) noted that the apparent agricultural potential of many places across North America (including the Everglades) led many to a swift and thoughtless attack upon the land. The consequences of such an onslaught in South Florida threaten the very source of opportunity and quality of life that drew people to the region in the first place.

Also interested in people's view of resources, Sonnenfeld has made more extensive use of psychology in his work on environmental perception. In 1978, he examined the relationship between perception of resources and subsistence security. He found that people's faith in technology along with constantly improving mobility have combined to reduce society's understanding of ecological relationships. "But even when resources are obviously being depleted and there are no more places to go," he argues, "there is often still lacking the sense of an option to conserve resources if this means reduction in standard of living or social well being" (p.21). He could just as easily have been discussing the attitude of those whose livelihoods are today directly or indirectly tied to agriculture in the Everglades. Current advertisements sponsored by large South Florida sugar producers ask consumers to remember that many people in the region depend on agricultural employment. Moreover, Sonnenfeld makes clear that "aesthetics and obligations to nature can be compromised when the security of subsistence is at stake" (p.23).

William Riebsame (1986) discussed the role of the Dust Bowl as a psychological anchor in the minds of those concerned with the Great Plains. He maintains that the Dust Bowl image led politicians to flood the region with financial aid. This assistance allowed farmers to continue making bad decisions in the region, setting the stage for swift ecological punishment during the next severe drought. Reibsame's work can easily be applied to the Everglades. South Florida promoters used flooding and hurricane disasters during the 1920s to secure federal funding for more extensive drainage and flood control works. These structural "solutions" may have set the stage for future environmental crises in the region.

Historical Geography of Wetlands

Although historical geographers have not devoted much attention to the Everglades, they have explored selected aspects of other wetland environments. Darby produced one of the first such studies when he examined eastern England's fenland. Originally published in 1940 under the title *The Draining of the Fens*, he wrote an updated version in 1983 entitled *The Changing Fenland.* Darby notes that organized drainage of large parts of the fenland began in the middle 1600s, and that both political and physical problems soon appeared. "What seemed a promising enterprise in 1652," Darby asserts, "had, by 1700, become a tragedy" (1983, p.107). One of the most significant problems was that of soil subsidence. Interested parties began to measure soil loss in 1848 by driving a long metal post (later called Holm Post) through the peat soil down to into clay. Although the top of the post was flush with the ground in 1848, by 1932 the top of the post stood nearly 13 feet above ground. Darby concludes that although England's fens became rich agricultural areas after drainage, flooding and soil subsidence became ever-increasing problems.

Veteran historical geographer Robin Butlin has also begun to take an active interest in the historical geography of wetlands. In a paper presented at the 9th International Conference of Historical Geographers in 1995, he examined environmental and ideological contexts of British, French, and Dutch wetland drainage schemes during the 17th and 18th centuries. Certain monarchs, aristocrats, Church leaders and other wealthy individuals proposed drainage and were opposed by many of those who livelihoods depended upon the rich natural resources of these ecosystems. Moreover, although Williams is perhaps best known for his work on the historical geography of American Forests, he edited a volume (1990) entitled *Wetlands: A Threatened Landscape*. His book makes use of wetland examples from around the world. Sweeping in scope, it covers a wide range of topics including wetland morphology, soils and ecology, archaeology, and agricultural impacts.

In the United States, Meyer (1935) studied the Kankakee Marsh of northern Indiana and Illinois and chronicled the clash between conservationists and those interested in reclaiming the marsh for agriculture. He concludes that "the Kankakee trucking areas may yet become the 'Garden of Chicago'" (p.395). Kaatz (1955) analyzed the impact of northwestern Ohio's former Black Swamp upon the region's settlement. He discovered that pioneers avoided the swamp until drainage in the late 19th century paved the way for extensive agricultural operations. Also in the 1950s, Hewes (1951) studied the wet prairie of the American Midwest. He looked at the nature, extent, and sources of information pertaining to the northern wet prairie. In 1952, Hewes and Frandson explored the role of drainage in the settlement of Story County, Iowa. As these two authors point out, geographers of the 1950s were usually fascinated with areal differentiation. This meant that their attention was more likely to be focused on differences in landscapes rather than on how draining wetlands reduced local differences in landscapes by making swamps look more like surrounding land uses. In 1988, Winberry looked at the historic use of South Carolina's freshwater wetlands. He notes that rice fields, managed forests, and hydroelectric developments have replaced many wetlands throughout the state.

A few geographers have investigated past perceptions of different wetland areas. Thompson (1969) discussed the linkage in people's minds between wetlands in California's Central Valley and malaria in the late 19th century. LeBlanc (1973) examined the differential perception of salt marshes by the folk and the elite in 19th century New England. He found that the folk were content to use marshes as pasture or as source of hay, while elites insisted upon trying to increase the agricultural productivity of their marshland through drainage. Winsor (1987) explained the origins of negative perceptions of the northern wet prairie. Nineteenth century settlers to east central Illinois cursed the excess water which severely hampered farming and transportation, served as a refuge for birds which ate their crops, and provided a haven for mosquitoes.

Finally, Prince (1995) chronicles the activities of successive occupants in modifying wetlands in central Wisconsin and suggests reasons for the failure of settlement. "Draining could only have succeeded," Prince maintains, "if the peat had not eroded and demand for hay and oats increased" (p.18). Yet as machines replaced horses shortly after the turn of the century, the demand and prices paid for feed grains plummeted--along with the hopes of those who invested in draining Wisconsin wetlands. After privately financed drainage enterprises in central Wisconsin went bankrupt during the 1920s and 1930s, state and local governments did not ask the federal government for help in conquering that environment. Instead, they reacquired wetlands in an effort to promote reforestation, improve wildlife habitat, better manage water resources, and improve recreational opportunities.

Over the past several decades, historical geographers have pursued a handful of themes regarding people's perceptions of wetlands, two of which have implications for similar research on the Everglades. First, LeBlanc maintains that New Englanders in upper and lower economic classes held sharply different views of salt marsh use. Economic class may have played a role in determining which people were more likely to support Everglades reclamation. Second, Prince reveals that privately financed drainage schemes were not always successful--some failed. His work raises an important question: under what circumstances will the tremendous resources of the federal government be called upon to support land transformation projects that might otherwise fail due to lack of support from the private sector? This dissertation will shed some light on these issues.

Human Habitation of the Great American Wetland Prior to the 1890s

There appears to be ample evidence that human beings inhabited South Florida long before the creation of the Everglades. Milanich (1992) suggests that prehistoric people arrived in southern Florida 13,000 years ago. Carr (1984 p.1) maintains that "the Paleo-Indian lived in southern Florida in association with mammoths, bison, and other types of megafauna." As a result of much lower sea levels at this time, Florida's land mass extended beyond its current configuration to the continental shelf.

With the disappearance of megafauna and the creation of wetlands in southern Florida, native people adapted and became increasingly dependent upon wetland and marine resources, especially shellfish (Milanich 1992). Milanich (1994 p.299) notes of South Florida that "at one time nearly every bit of higher land adjacent to the coastal salt marshes and estuaries probably had archaeological sites on it. Sites are largest where rivers, even small ones, drain interior wetlands." He adds that lack of information regarding South Florida's cultural assemblages led to the erroneous view that there was little prehistoric settlement in the Glades. It is clear that ancient people occupied both coastal and inland locations (Milanich 1994). What is not yet clear is whether coastal and inland sites were used by the same people.

Several archaeologists have determined that Native Americans altered their environment long before the dawn of the 20th century. Sears (1982) found substantial evidence of landscape alteration in the form of ditches and embankments at Fort Center, near Lake Okeechobee's western shore (Figure 3). He contends that people inhabited Fort Center as early as 3,000 years ago and that ditches were used until 600 to 800 A.D. Luer (1989) suggests that a series of relatively short canals in southern Florida, nearly 1,000 years old, may have been the beginning of a more integrated pre-Columbian society. Milanich (1994 p.279) summarizes that at many sites, pre-Columbian people "constructed earthworks, including mounds, ponds, borrows, ditches, canals, and linear and annular embankments, some in peculiar shapes."

It is estimated that by the time Juan Ponce de Leon arrived in 1513, at least several hundred thousand people probably lived in Florida (Milanich 1994). Some of these

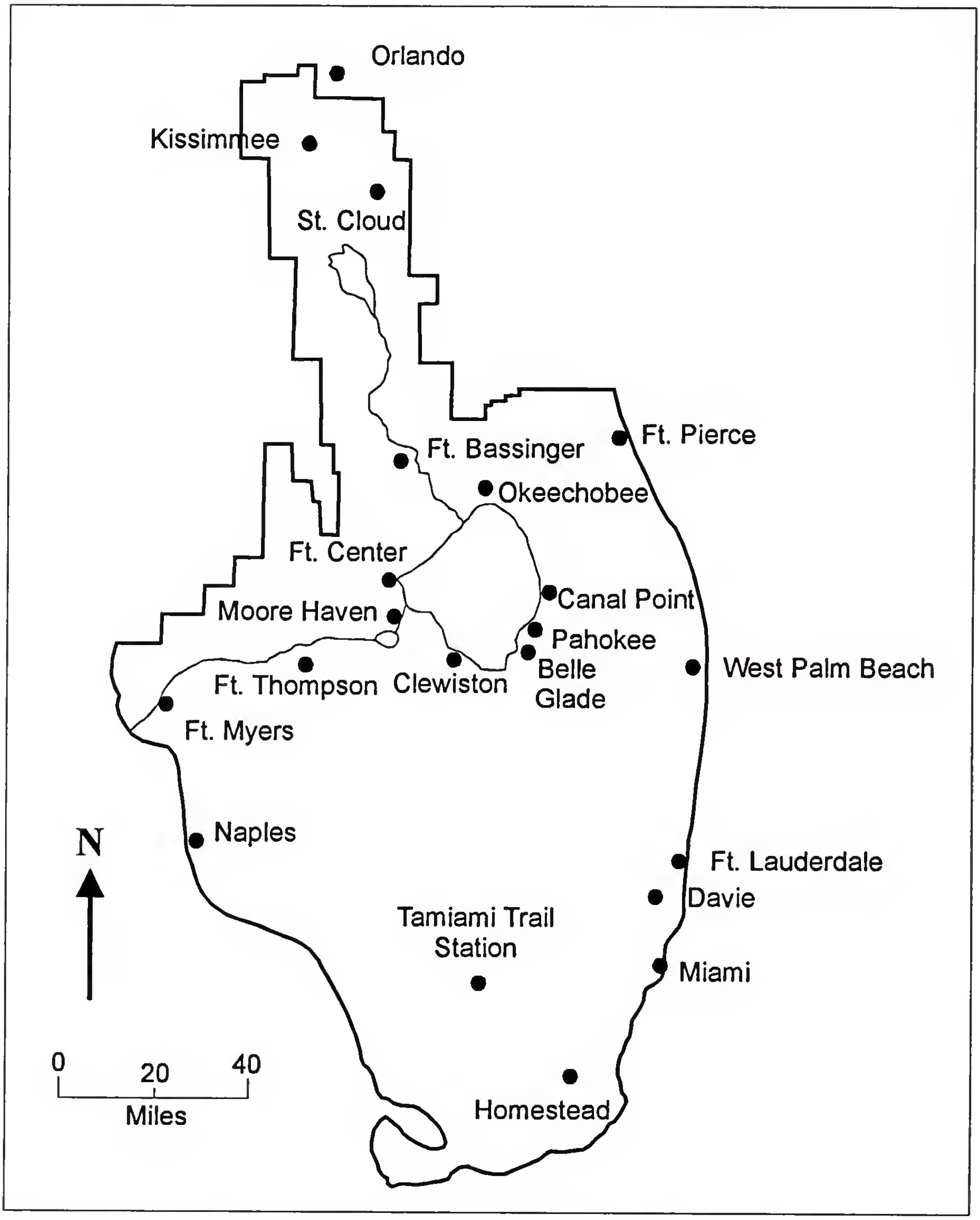

Figure 3. South Florida cities, towns, and weather stations.

inhabited South Florida which supported a handful of distinct cultural groups, the most powerful of which were the Calusa. Calusa people dominated southwest Florida until long after contact with the Spanish. Tequesta Indians lived in Dade County, and Boca Ratones ranged north of them. All of these people lived by fishing, gathering shellfish, and collecting plants and other animals (Milanich 1992). South Florida's Indians and swampy landscape prevented the Spanish from setting up a mission network similar to that which prevailed in north Florida until the early 1700s. Unfortunately, disease and warfare decimated native populations so that by 1750--according to Milanich (1994 p.xvi)--"no descendants of the native American Indians who had lived here since people first migrated into the land we now call Florida survived the European conquest."

Since the Spanish of the late 18th century were anxious to maintain their foothold in Florida, they invited Creek Indians from Georgia and Alabama to settle their vacant domain (Blackard 1992). These people eventually became known as "Seminoles." William Bartram found many Seminole settlements when he traveled through north Florida in the 1770s (Van Doren 1928). Runaway African slaves often sought refuge in Spanish Florida and frequent disputes along the border between Seminoles and Southerners led Spain to cede Florida to the United States in 1821. At this time, Florida Seminoles numbered about between five and six thousand; but there were only three small towns in South Florida--one on Florida's southwest coast and two near West Palm Beach (Fairbanks 1978; Blackard 1992). The Everglades seem not to have been occupied at this time. In 1823 the treaty of Moultrie Creek provided for the cession of all Seminole lands in Florida in exchange for a huge reservation in what was thought to be a useless portion of central Florida.

Mounting pressure from expansionist minded whites, overzealous slave catchers pursuing both free people and runaway slaves in Indian territory, and other problems led to President Andrew Jackson's Indian removal policy in 1830. Florida Seminoles resisted and fought United States troops from 1835 to 1842 (Mahon 1967). Most Seminoles were either killed or sent to Oklahoma. Yet a small band, probably less than 500 people, remained in the Big Cypress Swamp and Everglades (Figure 4), a virtually unknown and inaccessible portion of Florida in the 19th century (Fairbanks 1978).

Florida attained statehood in 1845 and despite substantial wartime activity south of Lake Okeechobee, South Florida (especially the interior) remained terra incognita throughout the 19th century. Wetlands comprised more than half the state, and almost all of South Florida. Accordingly, state officials begged the federal government to study the Glades and determine the practicability of reclaiming southern Florida's swamps. In 1847, the federal government authorized Buckingham Smith to prepare such a report, which he submitted a year later (U.S. Senate 1911). In his report, Smith combined personal observations of the territory with testimony from military officers who operated in the Glades during the Seminole War.

Smith explained that nobody lived in the interior of the Everglades, and that Seminoles inhabited the region between the Glades and the Gulf. He asserted (U.S. Senate 1911 p.52) that for anybody of "practical, utilitarian thought, the first and abiding impression is the utter worthlessness to civilized man, in its present condition, for any useful or practical object, of the entire region." He could not think of a solitary inducement to offer any prospective South Florida settler. In Smith's opinion (p.54), "the

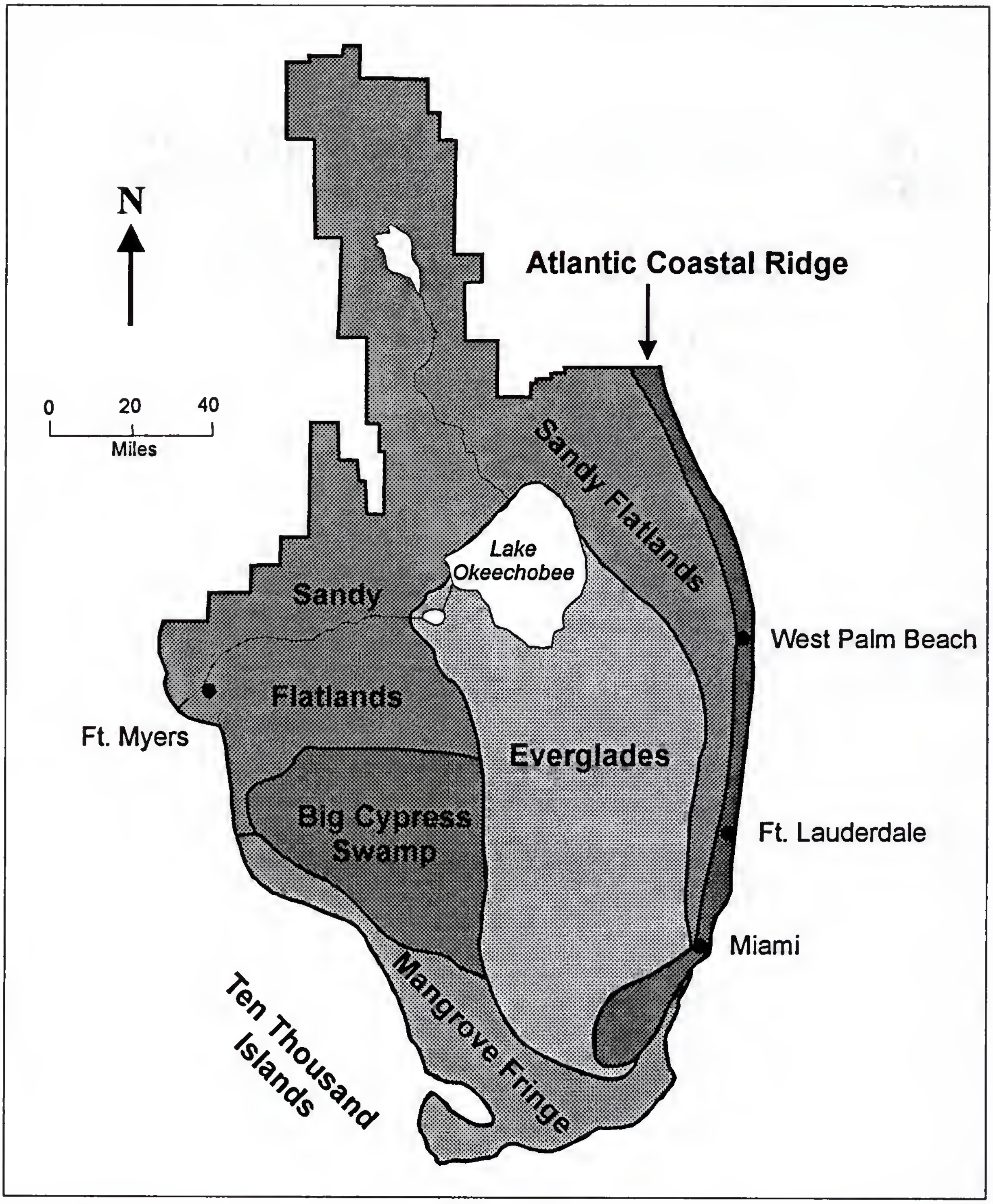

Figure 4. Physiographic regions of South Florida.

Everglades are now suitable only for the haunt of noxious vermin, or the resort of pestilent reptiles."

Smith believed that the Everglades rest "entirely below the region of frost," a claim highlighted by later boosters. In addition to rice, corn, and tobacco, he thought the region would eventually produce tropical fruits and therefore free the nation of dependence upon the West Indies for these products. Further indication of Smith's thought regarding land use rests in this comment (p.53): "he who causes two sheaves of wheat to grow where only one grew before, better deserves the thanks of his race than the author, the legislator, or the victorious general." It is hard to overstate the idea in the heads of upper class white males during the 19th century, that land must be made to produce tangible products for people to be of any value. Following an implicit cost-benefit analysis, Smith concluded that the Glades should be drained: "I do not hesitate to state my conviction that the increased value of the lands thus reclaimed would equal the cost of the undertaking." He suggested digging canals across South Florida in order to reclaim the Everglades.

The federal government offered Florida land for sale just like it did in every other state during the middle 1800s. Settlers bought land in North Florida, but there was little interest in wetland dominated South Florida. In 1850, Congress tried to help by passing the Swamp Land Act, which granted to Florida and other states all of the swamp and overflow lands within their borders. The act stipulated that proceeds from the sale of these lands were to be used only for the construction of levees and drains needed to reclaim these wetlands. Florida created an Internal Improvement Fund to sell wetlands and spend the revenue on drainage, but there remained precious little cash with which to carry out Buckingham Smith's recommendation.

Railroad companies were granted wetlands in exchange constructing lines in Florida, but the limited construction between 1850 and 1865 was destroyed during the Civil War. Florida then engaged in a protracted legal battle to maintain possession of its remaining wetlands in the face of war debts it could not repay. Philadelphia businessman Hamilton Disston single-handedly rescued the state in 1881 by purchasing four million acres of swampland in central and southern Florida for one million dollars (Dovell 1947). This gave Florida the money necessary to satisfy creditors and to eventually engage in drainage operations. According to Hanna and Hanna (1948), "transforming a portion of the earth's surface stirred his imagination, and among the sections of the earth NEEDING REMODELING, the boggy wilderness around Lake Okeechobee held high place." Disston and his engineer James Kreamer soon realized that they must lower Lake Okeechobee if they wanted to reclaim wetlands along the Kissimmee River and surrounding Lake Okeechobee. Accordingly, they dug a canal from the western end of the big lake, through Lake Hicpochee, to the headwaters of the Caloosahatchee River as well as a 13 mile canal from the southern edge of the lake into the Glades (later used as the beginning of the Miami Canal--Figure 5). Settlers along the Caloosahatchee River valley from Ft. Myers to Ft. Thompson (Figure 3) eventually questioned the wisdom of these canals. After a tremendous storm in September 1894 flooded almost all South Florida, Caloosahatchee Valley farmers complained that Disston's canals were responsible. They petitioned the state to fill the canals. In a 4 June 1895 letter to Disston, Kreamer insisted that "neither our company nor any known mortal agency will be found potent against the abnormal opening of the flood gates of heaven" (William S. Jennings, personal and public papers).

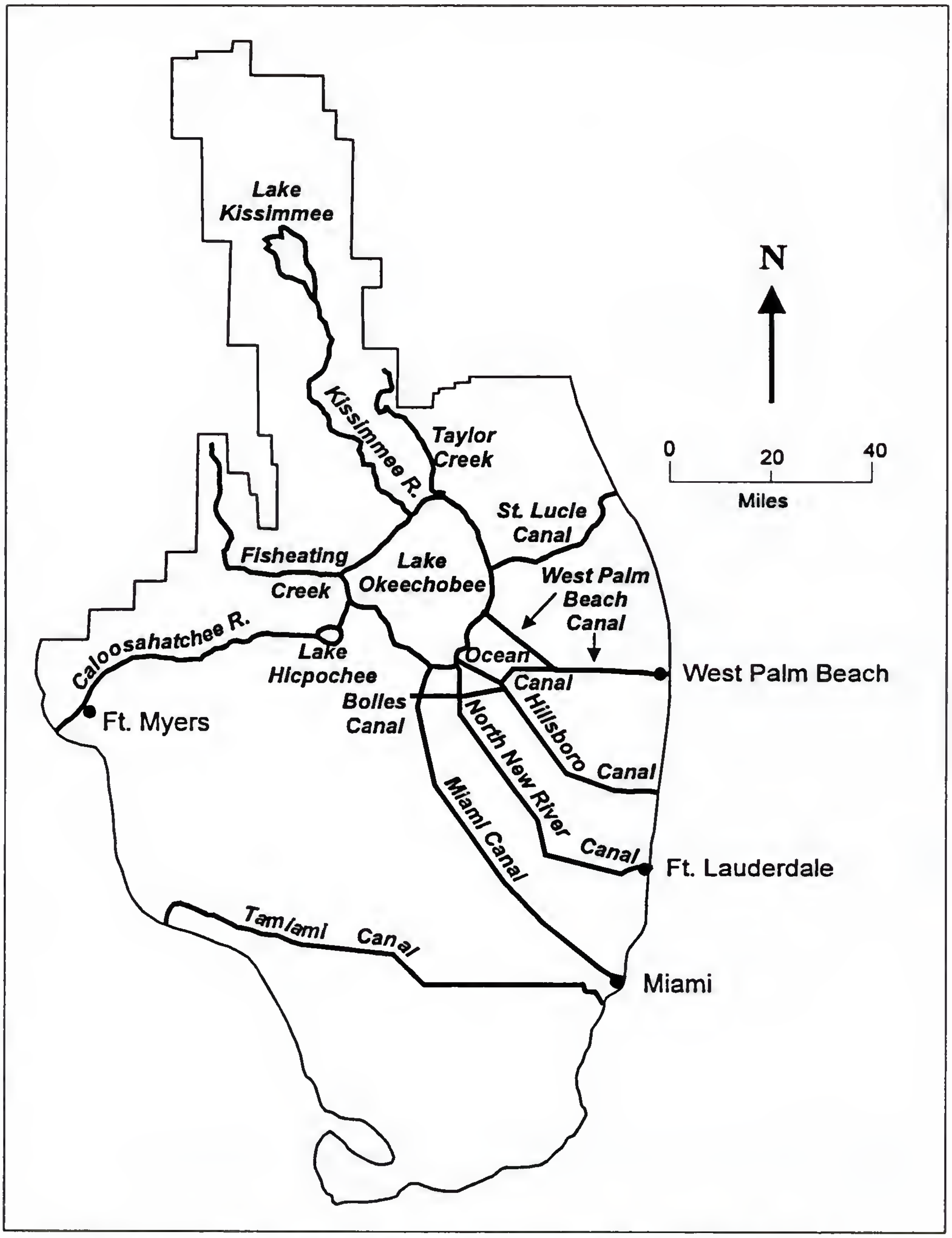

Figure 5. Major canals, creeks, rivers, and lakes of South Florida.

The Panic of 1893 dealt a crippling blow to this enterprise. Swamped with financial difficulties, Disston died in 1896, ending his company's reclamation efforts in South Florida. Although there was much controversy over how much land Disston actually reclaimed, he accomplished several things. His St. Cloud (Figure 3) plantation suggested potential in sugar production. His engineers dug canals linking Lake Okeechobee to the Caloosahatchee River; they dug canals linking several central Florida lakes with the Kissimmee River; and they even dug a canal from the south shore of Lake Okeechobee 13 miles into the Everglades.

Meanwhile, as Carter (1974 p.58) points out: "half the nation was a newly opened frontier made up of states vying to attract people and money; in bidding for Florida's share, state officials knew that the only major negotiable assets at their command were the public lands, and these they gave away recklessly." Ostensibly, Florida granted land to corporations in return for railroad construction. Yet less than half of the 564 railroads chartered ever laid track (Vance 1985). Practically all of the land granted was in north and central Florida--South Florida remained a wilderness. At least, this was the case until 1896 when Henry Flagler's Florida East Coast Railroad reached Miami.

Concepts and Methods

Prince (1971) outlined three principal realms of historical geographic research. First, scholars in the field have traditionally focused on reconstructing past geographies of particular places or regions, based on factual or "real world" data. Accordingly, Chapter 3 is devoted to portraying the Everglades as they existed in the mid 1890s, immediately prior to Anglo-American settlement. This chapter is an examination of key elements of the region's physical geography. The chief data sources include historic climatological data, soil surveys, topographic and geologic maps, historical photographs, as well as literature from early 20th century botanists who explored the region. Some of the data will be used to produce maps and graphs. All of this will be used in conjunction with field observations to produce a narrative reconstructing the geography of the Everglades.

Second, in an effort to explain why places and regions change over time, some practitioners examine past perceptions of places, or "imagined" worlds. Prince argues (1971 p.24) that "a fresh understanding of how other people in other times have perceived reality enables us to gain a fuller knowledge of the world." Accordingly, the bulk of the dissertation (Chapters 4 and 5) focuses on past perceptions of the Glades because herein lie the roots the environmental crisis and land use debate in South Florida. Land use in South Florida has become the subject of acrimonious debate. Environmentalists accuse farmers of polluting the Everglades with chemicals and nutrients from agricultural runoff and therefor, demand that South Florida's farmers pay to "clean and restore" the Glades. The region's farmers insist that they have a right to continue their operations and that they are responsible for only a "small share" of the cost of Everglades restoration. Consequently, it is unlikely that technically-oriented scientific studies alone will be sufficient to diffuse the situation. As Prince (1971 p.24) suggests, "a study of past behavioral environments provides a key to understanding past actions, explaining why changes were made in the landscape."

Archival materials have been used as a way of piecing together past perceptions of the Glades. The P.K. Yonge Library of Florida History at the University of Florida is a rich source of materials. It contains a substantial collection of manuscripts as well as personal and public papers of early 20th century pioneers and politicians. The library also maintains a host of relevant government documents, reports of special commissions, and promotional material produced by Everglades real estate companies. Travel accounts and articles from periodicals provide further insight. Newspapers are also rich sources of information on landscape perceptions, and the University of Florida houses several microfilmed copies of such papers as the *Miami Metropolis* and Jacksonville *Times-Union.* In most cases, quotations from all of these sources appear exactly as they do in the original documents. There were a few instances, however, where it was deemed appropriate to make minor editorial corrections.

Reconstructing past geographies, real or imagined, is an important step in explaining how places became what they are. Yet the most powerful historical geography comes from models that explain patterns of activity in a variety of places. Accordingly, some historical geographers delve into a third realm: that of constructing theoretical frameworks or models to shed light on geographic patterns in a variety of locations, Prince's "abstract" realm. In this chapter (Chapter 6), it is argued that the Everglades and other wetlands are part of a larger category of "flatlands" that are vulnerable to over-development. No model is a perfect representation of reality, but viewing the Glades and other wetlands as part of a larger class of land called flatlands may help explain their vulnerability to development.

It is commonly assumed that most people at the turn of the century (and shortly thereafter) supported efforts to drain the Everglades. While it is fair to assume that most people of the time encouraged wetland drainage generally, it appears that only middle class and wealthy people could afford to buy land in the Glades and actively support reclamation. This dissertation suggests that the many problems, disappointments, and calamities endured by Glades pioneers fueled a steadily growing opposition to the State's Everglades reclamation program from 1906 to 1930. By the late 1920s, it appears that only segments of society's elite continued to support Everglades drainage. Despite these problems, Glades boosters eventually convinced the federal government to invest hundreds of millions of dollars in an effort to reshape the region. Uncovering these perceptions of the Glades during the late 19th and early 20th centuries, and combining them with subsequent massive federal investment in the region, has led to the following suggestion. Perhaps the Great American Wetland, and all other wetlands, are part of a category of lands called flatlands--and these lands are particularly vulnerable to development pressure because of the perception that it takes little effort to reshape them.

CHAPTER 3
PHYSICAL GEOGRAPHY OF THE EVERGLADES

Before examining early 20th century perceptions of the Great American Wetland, it is necessary to assess the Everglades landscape that confronted people at the turn of the century. Scientists have generally described the "Everglades" as a 40-mile wide freshwater marsh that used to extend from the south shore of Lake Okeechobee more than a hundred miles to the extreme southern and southwest Florida coasts (Figure 4). Yet the Glades are intimately connected to the Kissimmee River and Lake Okeechobee, and they are part of several distinct different environments south of Lake Okeechobee. Moreover, many late 19th and early 20th century people viewed most of inland South Florida's wetlands as the "Everglades." For these reasons, the discussion on physical geography will include topics beyond the Glades themselves.

The Kissimmee River-Lake Okeechobee-Everglades Watershed

The Everglades occupy a region at the end of a much larger watershed extending from central Florida. Indeed, many authors refer to a "Kissimmee River-Lake Okeechobee-Everglades" watershed (Bottcher and Izuno 1994). Figure 4 illustrates the hydrologic connection between the river, lake, and Glades. The watershed's northern-most extension is in the center of the peninsula, just south of Orlando (Figure 3). Prior to the 1880s, a loose association of lakes, creeks, and wetlands conveyed water in a southerly direction toward Lake Kissimmee. During the 1880s, many of these lakes were connected by canals in an effort to drain wetlands and improve transportation. The southern end of Lake Kissimmee marks the beginning of the Kissimmee River, which empties into the north end of Lake Okeechobee. Although only 50 miles separate Lakes Kissimmee and Okeechobee, the Kissimmee River originally meandered approximately 100 miles in its tortuous course to the big lake (Perrin 1986). One observer remarked that it was the crookedest river he had ever seen, flowing in every direction except north (Blatchley 1932).

The Kissimmee River was quite shallow (averaging six to seven feet deep). Since rainfall fluctuates seasonally in the basin, the river had extremely low and unnavigable water levels for several months during the dry season (U.S. House of Representatives 1902). During the wet season, however, the shallow river frequently flooded the surrounding floodplain marsh (Figure 6). Although it was not ideal for human occupation, the Kissimmee River valley was a haven for fish, birds, and other wildlife (Toth 1993). Settlers to the region eventually called for drainage and the federal government responded by authorizing substantial modification of the river during the 1960s. By the 1970s, the Kissimmee River had been transformed into a 30-foot deep canal (C-38) approximately 50 miles long, complete with water control structures. Efforts to restore portions of the river to its original condition are currently under way (Cohn 1994).

Lake Okeechobee occupies a shallow basin, roughly 35 miles in diameter, between the Kissimmee River and the Everglades proper (Figure 4). Its deepest points are only a foot or two below sea level and because it is a broad, shallow depression in the

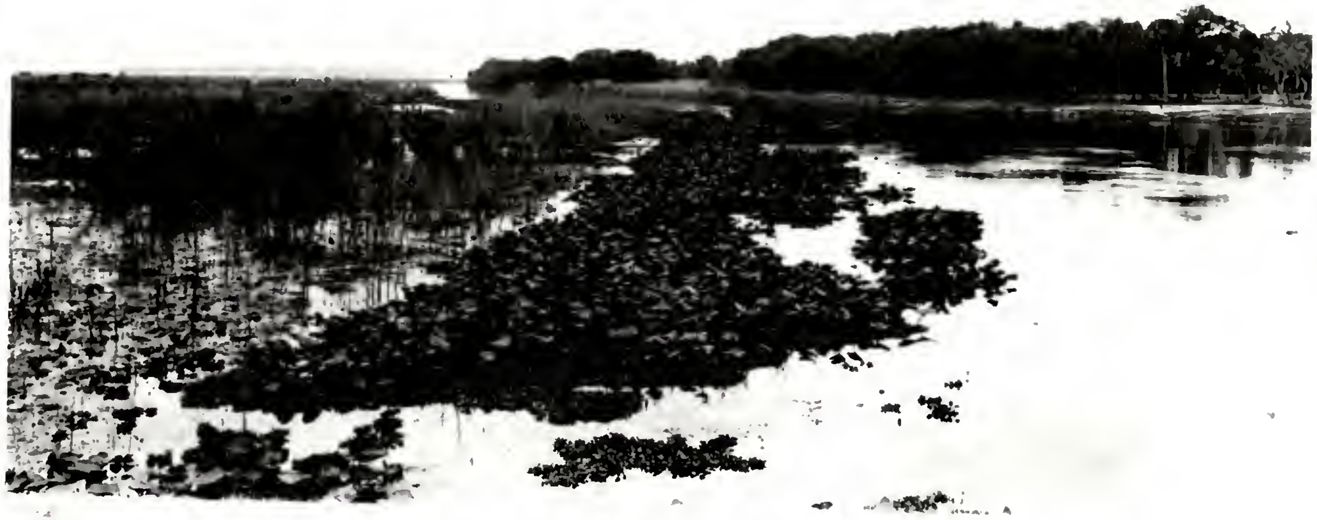

Figure 6. Photograph of the Kissimmee River near Fort Bassinger, May 1919.
Source: John K. Small photograph collection, Florida State Archives.

landscape, shifting water levels have caused the lake's total area to vary between 560 and 730 square miles (Brooks 1984). Historically, Okeechobee's level fluctuated significantly, but most early observers claim that Okeechobee usually stood at roughly 20 feet above mean sea level (Will 1956; Wright 1912). Higher levels caused overflows. Today, lake levels are closely regulated, generally between 15.5 and 17 feet above mean sea level (Bottcher and Izuno 1994).

In addition to the Kissimmee River, with its drainage area of 2,950 square miles--Okeechobee's tributaries include Fisheating Creek (311 square mile watershed) entering the lake's west side, Taylor Creek (with a drainage area of almost 100 square miles) entering on the north end, plus many smaller creeks and sloughs on the lake's north, east, and west sides (Figure 5). One of the region's first settlers, Lawrence Will (1964 p.8), records that although the lake's shores were flat and consisted largely of black muck, there were patches of sandy beaches to the east and south. John K. Small photographed one such beach on the eastern shore in 1916 (Figure 7). During the 1930s, engineers constructed a 30-foot high dike around much of the lake.

Historically, Lake Okeechobee never had a significant outlet for excess water. Even the Caloosahatchee River, whose headwaters are found in neighboring Lake Hicpochee, was not originally connected to Okeechobee. Yet there were more than a dozen relatively short "rivers," between 100 and 150 feet wide, leading from the lake's south shore into the sawgrass country a couple of miles further south (Figure 8). Lawrence Will drafted a sketch of these rivers in 1923 (Lawrence E. Will, personal and public papers), complete with names for each, and discussed them in several of his later

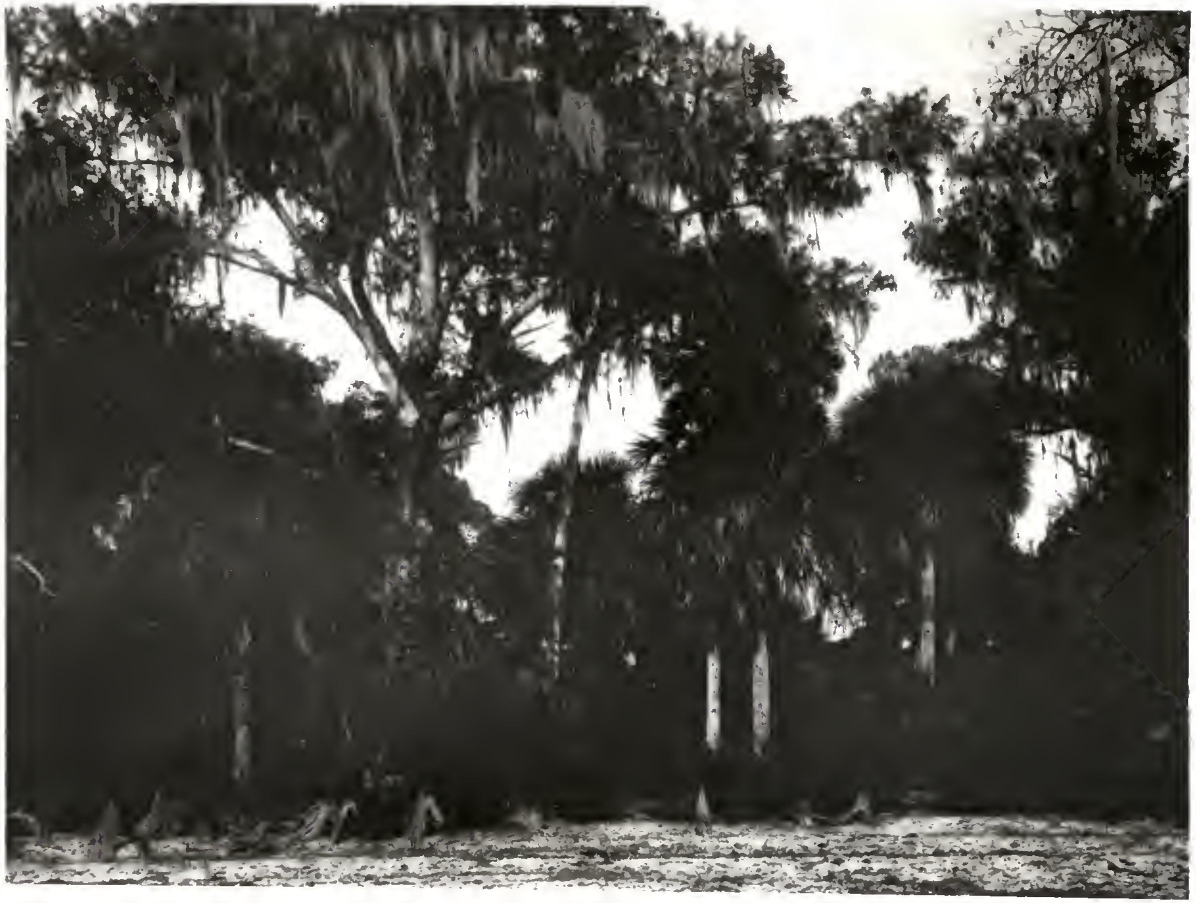

Figure 7. Photograph of the sand ridge on Lake Okeechobee's eastern shore, ca.1920.
Source: John K. Small photograph collection, Florida State Archives.

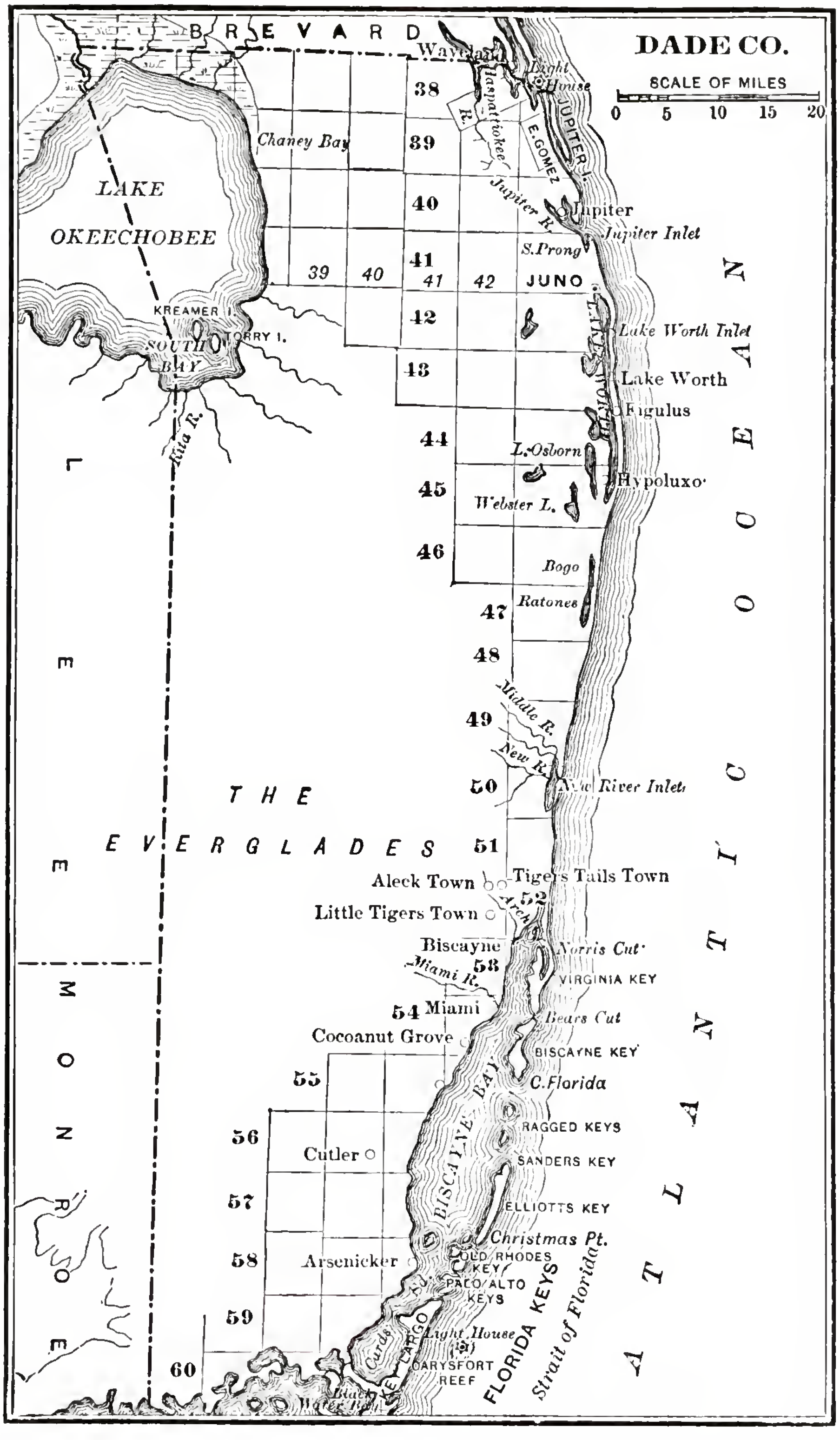

Figure 8. 1890 map of southeast Florida showing several short rivers leading from Lake Okeechobee into the Everglades. Source: Norton 1890

books (Will 1968, 1964, and 1961). Apparently these streams carried water to the Everglades. Will (1964 p.38) contends that the rivers usually had a sluggish current, but during times of high water in Lake Okeechobee, water gushed through them into the sawgrass. These rivers have since been completely filled in and converted to agricultural land. As flood water spilled over or through the lake's south shore into the sawgrass country, it then moved through the Glades into extreme southern Florida--partially as sheet flow and partially in ill-defined channels. Clearly, the Everglades are closely related to Lake Okeechobee and the Kissimmee River.

Geology and Topography

Geologically, Florida's Everglades are quite young. Practically all of southern Florida's surface or near-surface geology is composed of shallow marine carbonate sediments all of which were deposited during the Pliocene and Pleistocene ages (Davis 1943a). Missimer (1984 p.385) contends that "no two geologists seem to share the same opinion regarding the stratigraphic terminology or formation ages of the south Florida stratigraphic section." Yet a brief survey of the region's major geologic features is in order.

Although all of South Florida is extremely flat, the bedrock south of Lake Okeechobee can be viewed as a shallow trough. The eastern rim is formed by the Atlantic Coastal Ridge, an approximately five mile wide strip of limestone, coquina, sand and shell extending from north of West Palm Beach to south of Miami (Missimer 1984; Figure 4). This Pleistocene-age ridge is from two to seven meters above sea level and separates the

Atlantic Ocean from the Everglades. Closely related are the South Florida rocklands, an extension of the Atlantic Coastal Ridge (with much thinner soils) which extend from Miami beyond Homestead into the Everglades. Being slightly higher than the Glades, the ridge frequently (but not always) avoided inundation and thus became the focus of settlement in southeast Florida. Norton (1890 p.239) characterized walking on the ridge that separated the Glades from the sea as "indescribably difficult and even dangerous, owing to the disintegrating rock that covers the surface."

Until the early 20th century, about a dozen relatively short rivers (less than ten miles long) flowed across low spots along this ridge (Figure 9). These rivers, including the Miami, Hillsboro, and New rivers, drained only a small percentage of surface water from the Glades. Charles Norton (1890 p.237) left the following description of the Miami River near the turn of the century.

> It divides into the north and south forks about three miles from the mouth, both of them swift, clear streams. The north fork has impassable rapids, but the south fork can be ascended in small boats to its outlet from the everglades . . . The grasses and other aquatic plants that cover the bottom of the stream are wonderfully beautiful in their varied color and graceful movements as they are swayed to and fro by the clear rushing water.

During the early 20th century, practically all of these rivers were dredged and converted into drainage canals, some extending across the Everglades (Figure 5). As water levels in the Glades plummeted, these rivers/canals became conduits for salt water which penetrated inland along the surface and then moved down through porous bedrock (Figure 10). Water management officials eventually placed several water-control structures across the canals in an effort to minimize salt water intrusion (Leach and Grantham 1966).

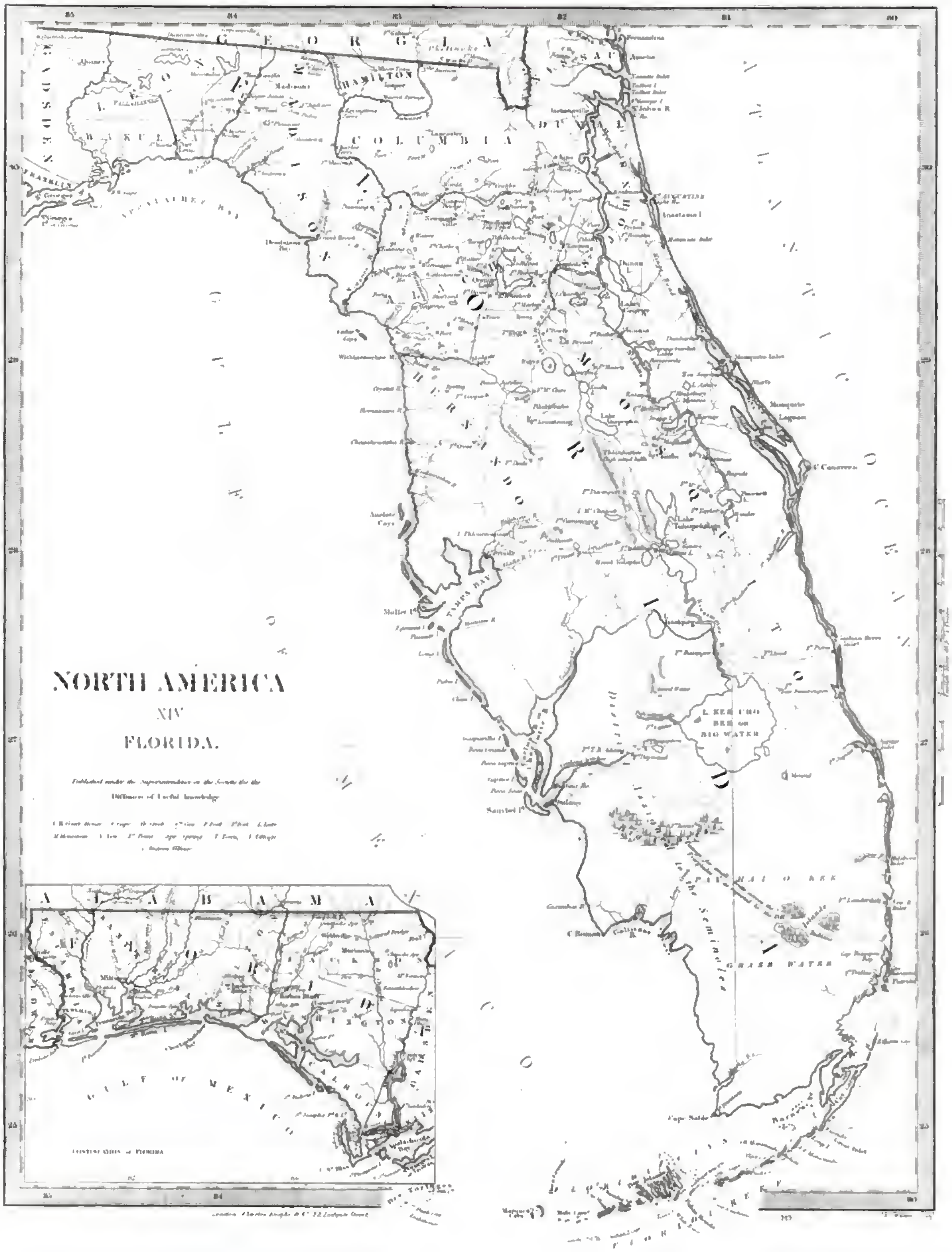

Figure 9. 1846 map of Florida showing several short rivers running through both southeast and southwest coasts. Source: University of Florida Map Library.

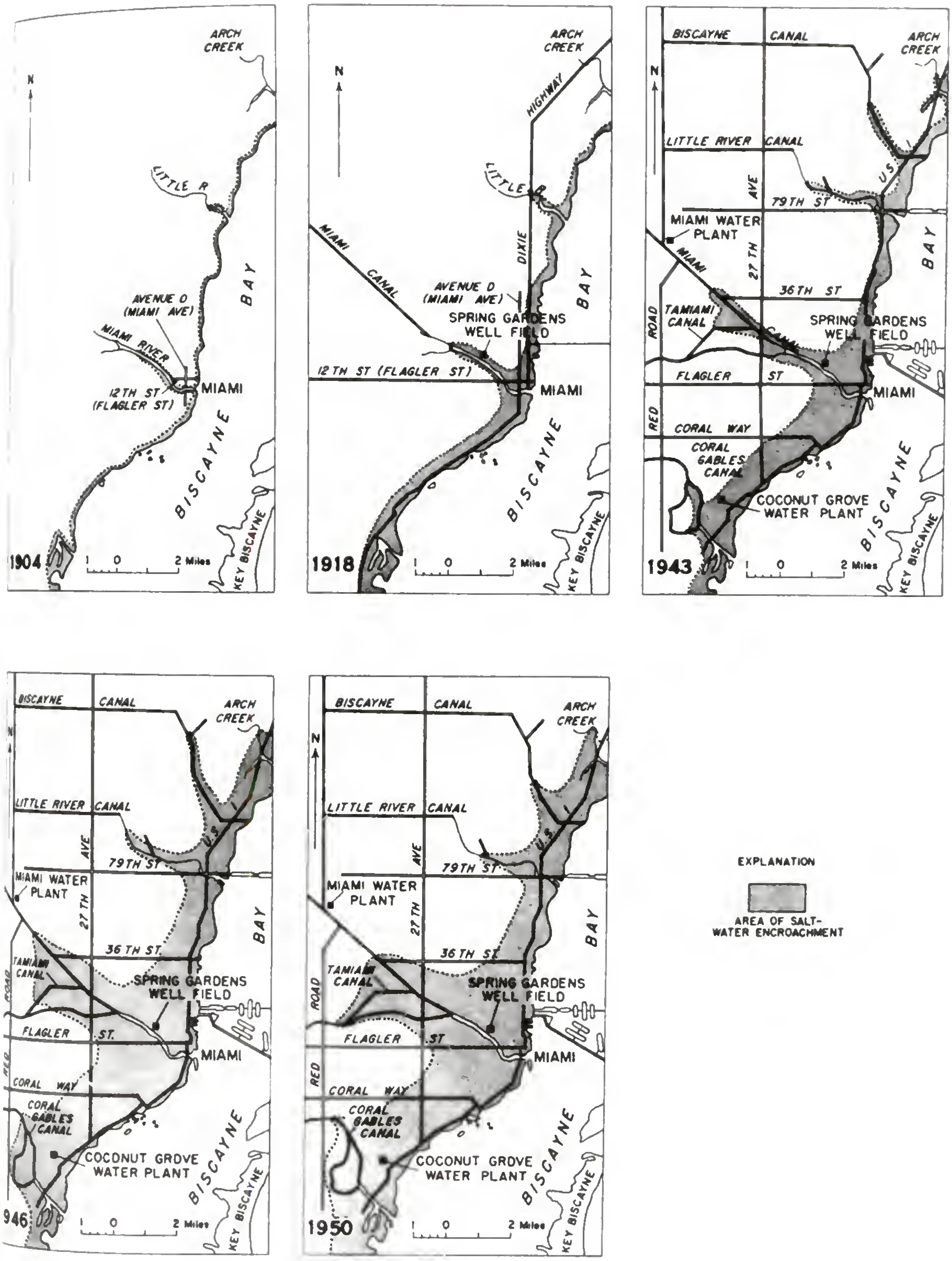

Figure 10. Salt-water intrusion at Miami, 1904 to 1950.
Source: Parker et al. 1955.

On the western side of the Everglades, the edge of the trough is less well defined. This broad area, much of it known as the Big Cypress Swamp, is only slightly more elevated than the Everglades. Southwest Florida also has several short creeks and streams which conduct water from the Glades to the sea (Figure 9). The Everglades occupy a limestone trough between the Big Cypress Swamp and sandy flatwoods to the west and the Atlantic Coastal Ridge to the east, and extend to mangrove fringes along Florida's southern coast (Figure 4). Stephens (1969) points out that the northern potion of the Everglades (or Upper Glades), are underlain mostly by hard, relatively impermeable limestone. The southern, or Lower Glades, are underlain mostly by very permeable limestone.

This distinction is worthy of additional comment. South Florida's Biscayne Aquifer underlies most of Dade and Broward Counties plus parts of Palm Beach and Monroe Counties (Figure 11). Kreitman and Wedderburn (1984) suggest that the Biscayne might be the most permeable water table aquifer in the world. It is up to 240 feet thick along the coast between Miami and Fort Lauderdale, gradually becoming thinner toward the west across the Glades (Miller 1990). Up to the beginning of the 20th century, tremendous volumes of water in the Glades generated sufficient head or pressure to keep sea water from moving inland. Indeed, subterranean flows in the aquifer commonly emerged as springs along the Atlantic Coastal Ridge and even out in Biscayne Bay (Willoughby 1898). The Biscayne Aquifer is still South Florida's chief source of drinking water, but constant increases in the lower east coast's population since 1895, plus Everglades drainage, have altered the region's hydrogeology. Not only have the region's springs ceased to flow,

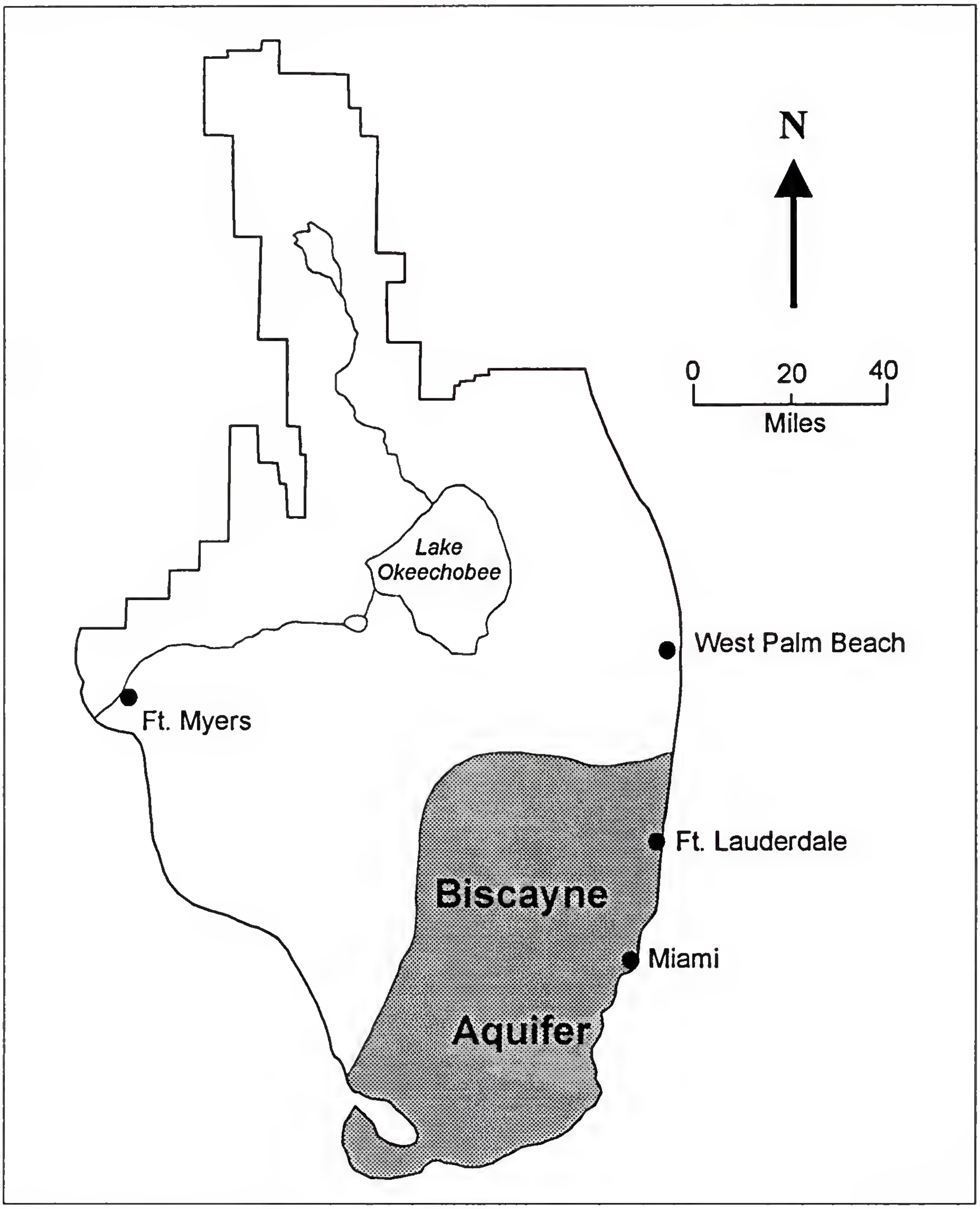

Figure 11. South Florida's Biscayne Aquifer.

reduced freshwater head has induced underground salt water intrusion, forcing public water supply officials to move their wells inland (Leach and Grantham 1966).

Soils

Gleason and Stone (1994) contend that the lack of glacial age sediments in the Everglades trough indicates that during the last period of low sea level, South Florida did not have its present abundant rainfall or widespread wetlands. Consequently, they maintain that large-scale peat deposition in southern Florida probably did not begin until rainfall increased, sometime between 5700 and 4800 years ago. Stephens (1969) contends that rising sea level obstructed freshwater drainage from the Glades and promoted conditions conducive to the accumulation of wetlands and organic soils. McDowell et al. (1969) believe that peat formation began between 5000 and 4400 years ago. These authors assert that "water table fluctuations were such that the balance between accumulation and destruction of the organic soil required about 500 to 1000 years to build up the 7.6 cm of basal mucky peat" (p.745). After this period, plant growth exploded and continued to build between seven and eight cm of peat per century until drainage operations began in the early 1900s. Bedrock topography and hydrology substantially influenced the distribution of early plant communities which became the basis of the region's peat soils. The distribution of peats across south Florida--both vertically and horizontally--is also related to long-term changes in the Everglades environment like hydroperiod, drought, fire, floods, and animal activity (Gleason and Stone 1994).

Much of the Everglades trough is filled with histosols, soils containing at least 78% (by volume) organic matter (Brady 1990). Histosols are common in wetland environments, because frequent flooding retards decomposition of plant remains. Soil scientists at the turn of the century identified organic soils as either relatively undecomposed peat or well decomposed muck (occasionally using "peaty muck" as an intermediate term). Modern soil scientists distinguish three agriculturally significant suborders of histosols based on the degree of organic decay (Brady 1990). Fibrists are the least decayed, saprists the most decayed, and hemists are moderately decayed. Snyder (1994) maintains that most of the soils in the northern half of the Everglades are heavily-decayed saprists. Early 20th century Everglades boosters claimed (or implied) that most of South Florida was covered with a uniformly thick, fertile layer of muck. Yet organic soils can be highly variable in terms of depth, chemistry, and bulk density, much of which is a function of the different plants that form the basis of the soil.

In 1915, the United States Department of Agriculture authorized its Soils Bureau to conduct a soil survey in South Florida (Baldwin et al. 1915). Inasmuch as there were no roads through the Glades at that time, soil scientists followed the course of the North New River Canal, taking samples from a four to six mile swath along the course of the canal from Ft. Lauderdale to Lake Okeechobee (Figure 5). In contrast to Snyder (1994), Baldwin and his colleagues found that most of the Glades were covered with what they called "brown fibrous peat," or what is today referred to as a moderately decayed hemist soil. Although they confirmed promoters" contentions of a large area of brown fibrous peat from 9 to 11 feet deep, they also discovered that only the soil within a few miles of

Lake Okeechobee could be classified as muck or peaty muck. Although the Natural Resource Conservation Service now uses different terminology, it seems possible that nearly a century of drainage and reclamation has transformed much of the soil in the Everglades from an undecomposed fibrist to a well-decomposed saprist.

Mucks and peaty mucks along the south shore of Lake Okeechobee were primarily organic but had a comparatively high percentage of sand, silt and clay, probably deposited when the lake overflowed its banks (Stephens 1969). Baldwin et al. (1915) correctly recognized this soil's value for agricultural production. This band of soils was later discovered to almost surround Lake Okeechobee. From nearly three miles south of the lake for about 30 miles along the canal, however, they recorded the presence of brown fibrous peat. This soil was not as well decomposed as it is today; it underlies today's Everglades Agricultural Area (Figure 2). From the 30 mile post (30 miles southeast Lake Okeechobee) to the outskirts of Ft. Lauderdale, they found peat soils with higher percentages of sand. Maximum soil depths of 9 to 11 feet were found a few miles south of Lake Okeechobee, and it later became clear that this soil type becomes progressively more shallow in every direction from the south shore of the lake. More recent soil surveys have distinguished several different types of peats and mucks, but even these agree that the most productive soils lie within a few miles of Lake Okeechobee.

The Atlantic Coastal Ridge from West Palm Beach to Miami is dominated by a variety of sandy soils. The soil map of the ridge produced by Baldwin et al. (Figure 12) is a virtual jigsaw puzzle of different soils. The coarse sands are excessively drained, while fine sands or those with some clay or silt retain some moisture. Along the ridge south of

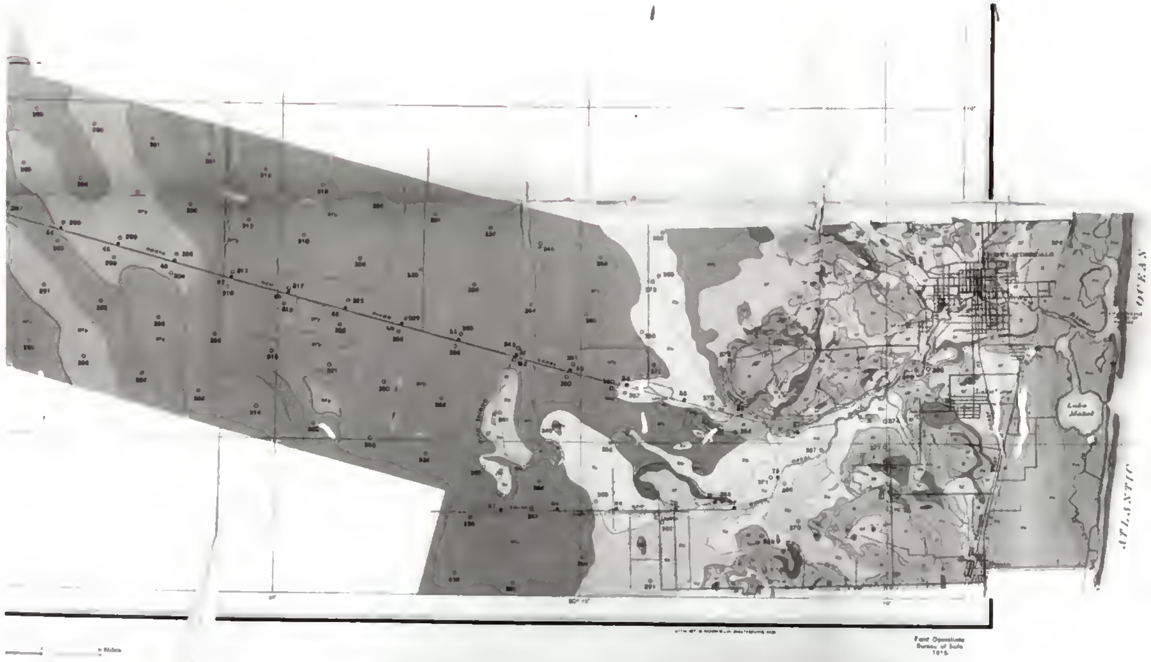

Figure 12. Lower right hand corner of a 1915 soils map showing the contrast between the soils of the Everglades and the diversity of soils along the Atlantic Coastal Ridge around Davie and Ft. Lauderdale, Florida. Source: Baldwin et al. 1915.

Miami, relatively well-drained rocky soils prevail (Leighty and Henderson 1958). Rocklands southwest of Miami frequently have little or no soil except in cavities or solution holes in rocky outcrops (Leighty and Henderson 1958).

Eastern Everglades soils, underlying what are now the water conservation areas (Figure 2), are dominated by Loxahatchee and Everglades peat. These soils have a higher percentage of sand mixed with peat and are generally less than four feet above bedrock. According to the Leighty and Henderson (1958 p.22), "when drained, the organic matter shrinks rapidly , and the low water holding capacity of the soil material and the porosity of the underlying rock cause the soil to be droughty." Stephens (1969) suggests that this organic matter shrinks rapidly because it is based on the remains of succulent aquatic vegetation rather than sawgrass. So useless for traditional agriculture are these soils that recent soil surveys do not bother to map them (Pendleton et al. 1976; McCollum et al. 1978).

Immediately southwest of Lake Okeechobee and west of the Everglades proper are the sandy flatlands or flatwoods (Figure 4); south of the flatwoods is the Big Cypress Swamp. As the titles of these regions imply, they have soils different from those found in the Everglades. Both of these areas are slightly more elevated than the Glades (the Big Cypress a little less so), therefore inundation and deposition are less extensive. Sloughs and freshwater marshes, however, are sprinkled throughout this region. Soils of the Big Cypress area generally consist of a thin (less than two feet) layer of marl, sand or combination of the two (McPherson 1982). The flatwoods of Hendry County (just north of Big Cypress; Figure 1) are sandy in nature. According to Belz et al. (1990 p.11), "some have a dark sandy subsoil, some are sandy throughout, some have a loamy subsoil, and some have a loamy surface layer." Toward the eastern end of the county, as one approaches the Everglades, one may encounter thin layers of muck.

There is one aspect of some South Florida soils that has changed dramatically since 1895: soil depth. Peat soils accumulate because they are inundated many months per year, prohibiting thorough decomposition of organic matter. If peat soils are drained, as in the Everglades, they begin to decompose rapidly. Indeed, soil subsidence has been a persistent problem in the Everglades since the early 1900s.

Herman Gunter (1913) of the Florida Geological Survey compiled a long list of elevations for points all over Florida. According to his report, the Everglades--near the south shore of Lake Okeechobee--were 21 feet above sea level. Stephens and Johnson engaged in an extensive study of soil subsidence in South Florida in 1951. Although they erroneously predicted that soils would become too shallow to farm throughout most of the Glades by the year 2000, soil subsidence is still a serious problem (Stephens 1984). Topographic maps prepared in 1970 by the USGS reveal that elevations in the same area were only between 12 and 13 feet above sea level. Inasmuch as most experts believe that Everglades soils subside at a rate of approximately one inch per year, it seems safe to assume that elevations south of the lake are even lower today (George Snyder, personal communication).

Early 20th century Everglades promoters recognized that peat and muck soil shrunk somewhat after drainage. Yet Stephens and Johnson (1951) contend that "in making plans for the original drainage of the Everglades, apparently the main causes of subsidence were misunderstood." Organic soils subside for several reasons (Stephens 1984). Soon after drainage, peats and mucks shrink due to desiccation. Organic material in the soil contains water within partially decomposed plant tissues. Upon drainage, this water evaporates. Even after reflooding, organic soils hold only a fraction of the water previously held. Moreover, as drainage lowers the water table, organic soils consolidate because they lose the buoyant force of groundwater. With the appearance of heavy farm machinery at the dawn of the 20th century, the first five to ten years of cultivation with such equipment caused organic soils to shrink due to compaction. Furthermore, if dried sufficiently, soils dominated by organic matter will burn. Although selected places in the Glades suffered considerable fire damage as reclamation progressed, such damage was generally local.

The most significant cause of soil loss in the Everglades is biochemical oxidation. As peat and muck soils are drained, oxygen "breathing" bacteria colonize and consume the organic matter. Cold climates reduce biological activity generally; but South Florida's warmer climate is a haven for microscopic organisms that consume organic material in soils. The relatively slow rate of peatland subsidence in both Europe and the northern United States prevented scholars in these areas from recognizing this important factor.

Vegetation

Although southern Florida has been radically transformed since 1895, we know some things about early 20th century vegetation patterns in South Florida. Among the more important pieces of evidence are two monographs and accompanying maps by John

W. Harshberger (1914) and John H. Davis (1943a). Both men based their maps and corresponding discussion on extensive field work. Harshberger's map portrays Everglades vegetation as it existed when people began to alter South Florida's surface hydrology. He correctly pointed out that topographic differences of a few inches can create sufficient soil moisture differences to cause radical changes in vegetation. Inasmuch as canal construction virtually ceased between the late 1920s and the late 1940s, Davis's map probably reflects vegetation patterns in the Everglades near the end of the study period (1930). As Davis maintained (1943b), any classification of vegetation groups is greatly generalized and lines drawn on maps are to a large extent arbitrary. What follows is a summary of the two maps, especially portions dealing with the Everglades proper, supported by other published observations.

Both maps make clear that South Florida has much variety in vegetation (Figures 13 and 14). Nevertheless, Harshberger shows the Everglades trough as a nearly uniform sea of sawgrass which ranges from just below Lake Okeechobee to just above the southern tip of the peninsula. After traversing the region, Harshberger satisfied himself that "the saw-grass is everywhere, the common and typic plant with an admixture of less prominent species, with lagoons and channels filled with aquatic plants" (p.122). He also described "arms" of the Glades nearly surrounding Okeechobee, and several others penetrating the Atlantic Coastal Ridge. Sawgrass is not a grass but a sedge, and derives its common name from the jagged edges of its leaves. Loveless (1959) observed that sawgrass attains its greatest density on sites covered with surface water for most of the year. On relatively dry sites, it occurs in much thinner stands. Indeed, Harshberger (1914)

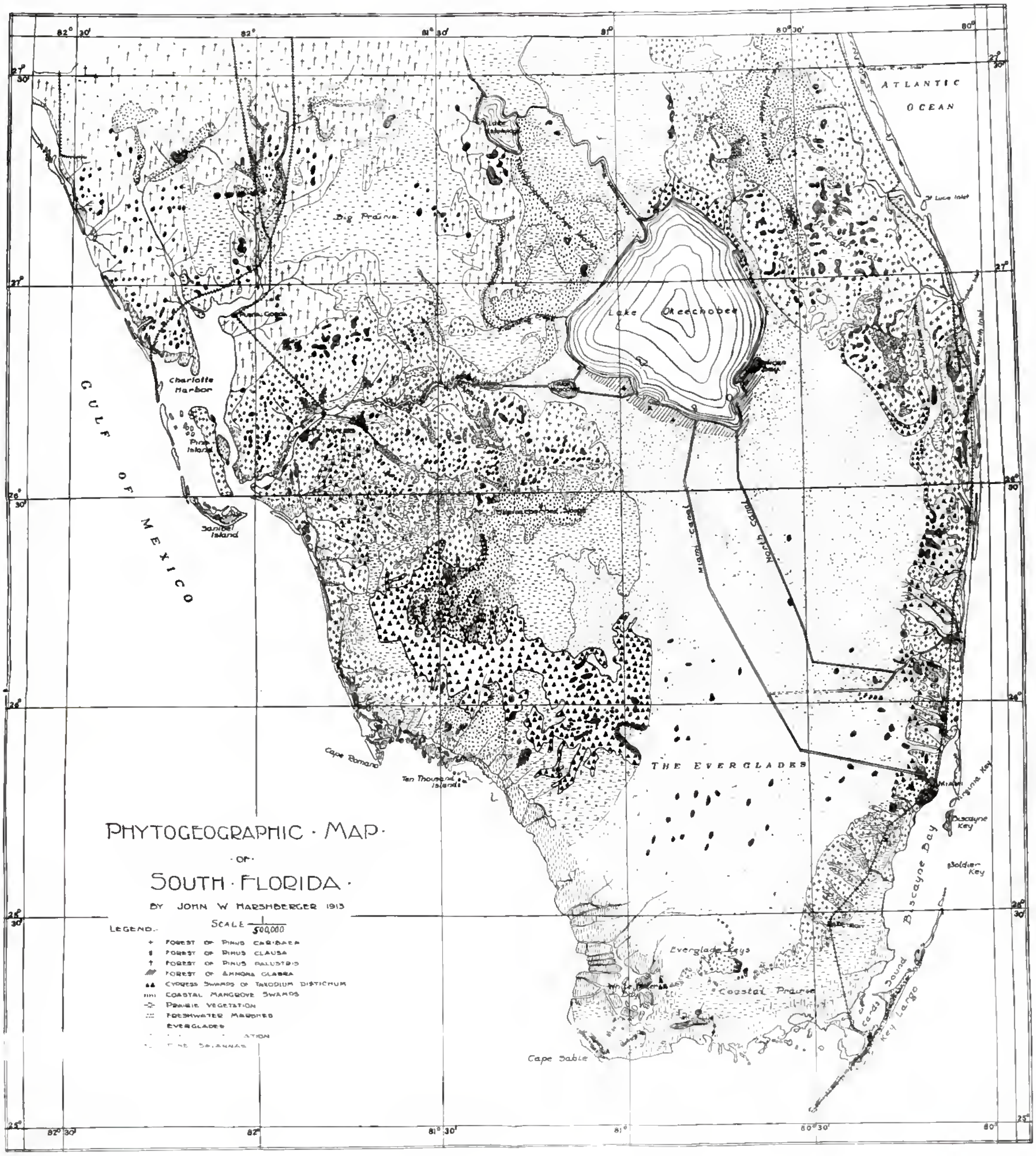

Figure 13. 1914 map of South Florida vegetation.
Source: Harshberger 1914.

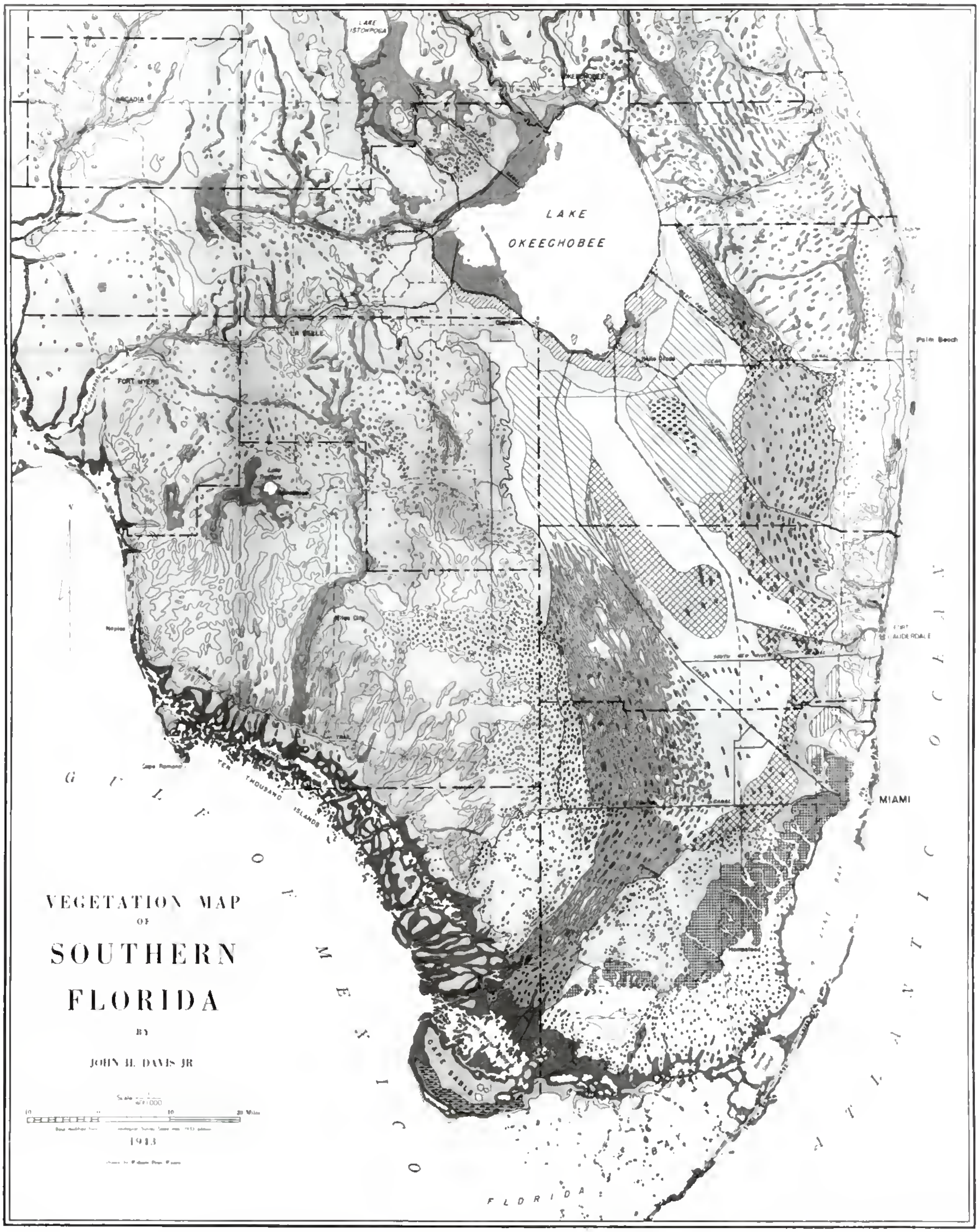

Figure 14. 1943 map of South Florida vegetation.
Source: Davis 1943a.

contended that South Floridians were well aware that the northern half of the Glades, or "Upper Glades," consisted of much taller and thicker stands of sawgrass than the more southerly or "Lower Glades." He speculates that this difference was due to the relatively thick and wet peat soils of the Upper Glades. Figure 15 shows the thin and patchy nature of sawgrass in the Lower Glades.

On the other hand, Davis's map is a more heterogeneous portrayal of the Glades (Figure 14) and he explained it thus: "most of this unbroken marsh was once densely covered with tall saw-grass, but drainage, consequent subsidence of the peat soil, and fires have thinned out the natural plant cover and promoted the growth of weeds, bushes, and other plants, until many areas now have only medium to very sparse growth" (1943b p.108). Indeed, most of the tall, dense, and almost impenetrable stands of sawgrass in the northern half of the Glades have been replaced by sugar cane fields. Also sprinkled throughout the Everglades are freshwater marshes dominated by other plants such as cat-tails, ferns, spike rushes, water lilies or other aquatic plants. Yet, sawgrass was and still is found mixed with other plants throughout South Florida.

According to Harshberger (Figure 13), Lake Okeechobee's south shore had a one-half to three mile thick band of custard-apple trees. Davis believed this area once consisted of two separate bands of vegetation, each extending away from the lake a couple of miles (Figure 14). According to Davis, the band closer to the lake was dominated by custard-apple trees. The band further away from the lake was dominated by willow and elderberry. Now virtually erased from Florida, custard-apple trees were particularly interesting for they gave Okeechobee's south shore an enchanting appearance. Drawing upon notes taken

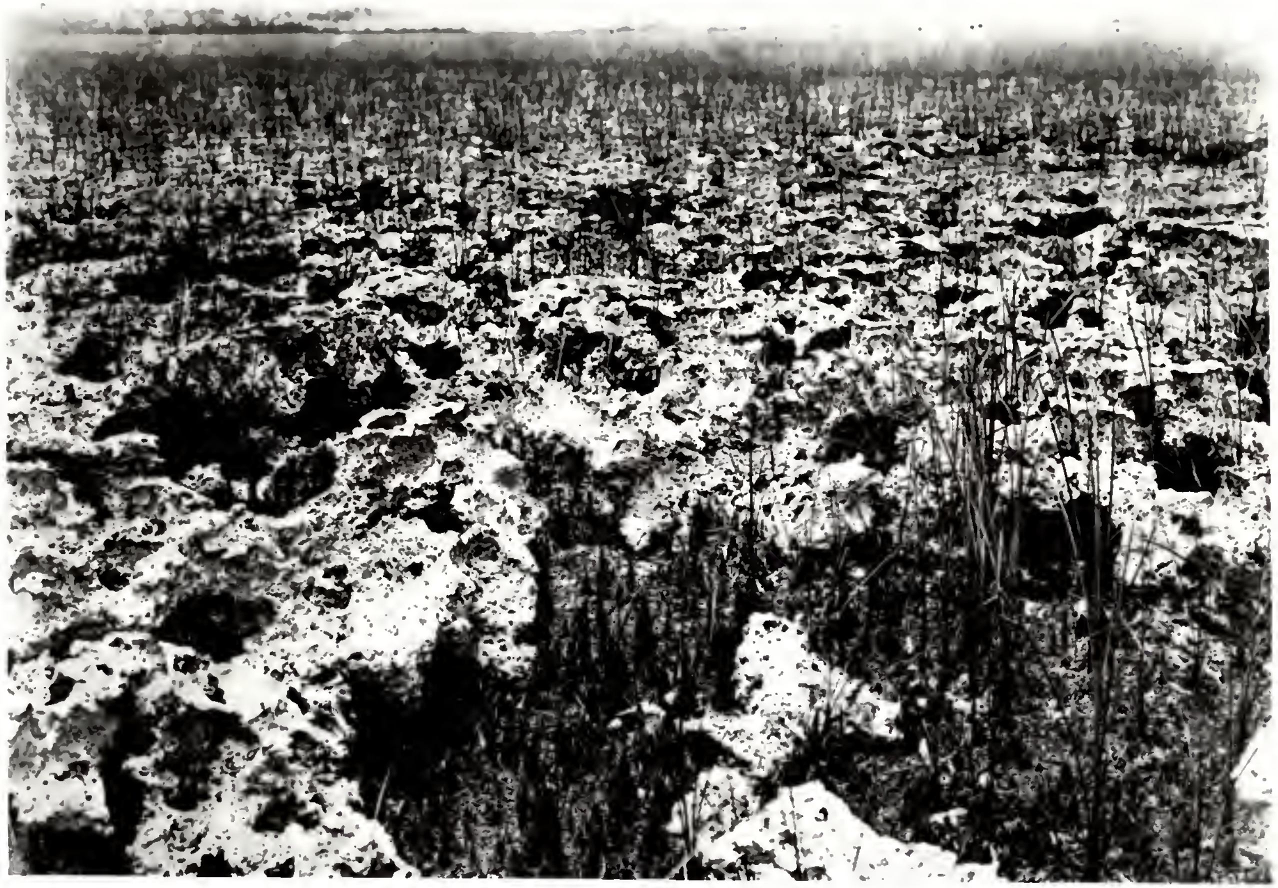

Figure 15. Photograph of the southern or “Lower” Everglades, May 1918.
Source: John K. Small photograph collection, Florida State Archives.

during a trip to Lake Okeechobee in 1911, Blatchley (1932) later wrote that the trees were from 6 to 40 feet tall, with fruit that was edible but not very tasty. He observed that these plants were common in the West Indies and Florida Keys; that they form dense thickets and are frequently covered with moonflower or moonvine, which created a mysterious, jungle-like appearance (Figure 16). Blatchley noted that this "is one of the most common vines of southern Florida and has the same range and habitat as the custard-apple" (p.102). Since custard-apple trees had crooked trunks and brittle wood, they could not be used for lumber, and their fruit could not be eaten, Lawrence Will (1977 p.34) added "I reckon it was near about the ugliest, most useless tree the good Lord ever made." Will claims that by the late 1920s, most of the land within a few miles of the lakeshore had been cleared of custard-apple trees and converted to cropland.

Immediately west of the southern half of the Everglades lies the Big Cypress Swamp. The dominant vegetation, cypress trees, are notoriously tolerant of high water levels and relatively large trees usually found crowding the banks of waterways within the swamp; dense, circular clusters called cypress domes or cypress heads usually indicate depressions in the landscape that can be covered with water most of the year. Yet the region's name derives from the expanse of dwarf cypress that are scattered across the landscape (Figure 17). Mixed throughout Big Cypress country, and especially north of it, is a mixture of sandy flatlands (or pine flatwoods) and wet prairies. The pine trees in this region are frequently surrounded by palmetto bushes (Figure 18). Stewart (1907 p.28) observed that the more vigorous the growth of palmetto, the drier the land. Davis (1943a p.155) noted in the early 1940s that pine forests "have nearly all been so thoroughly

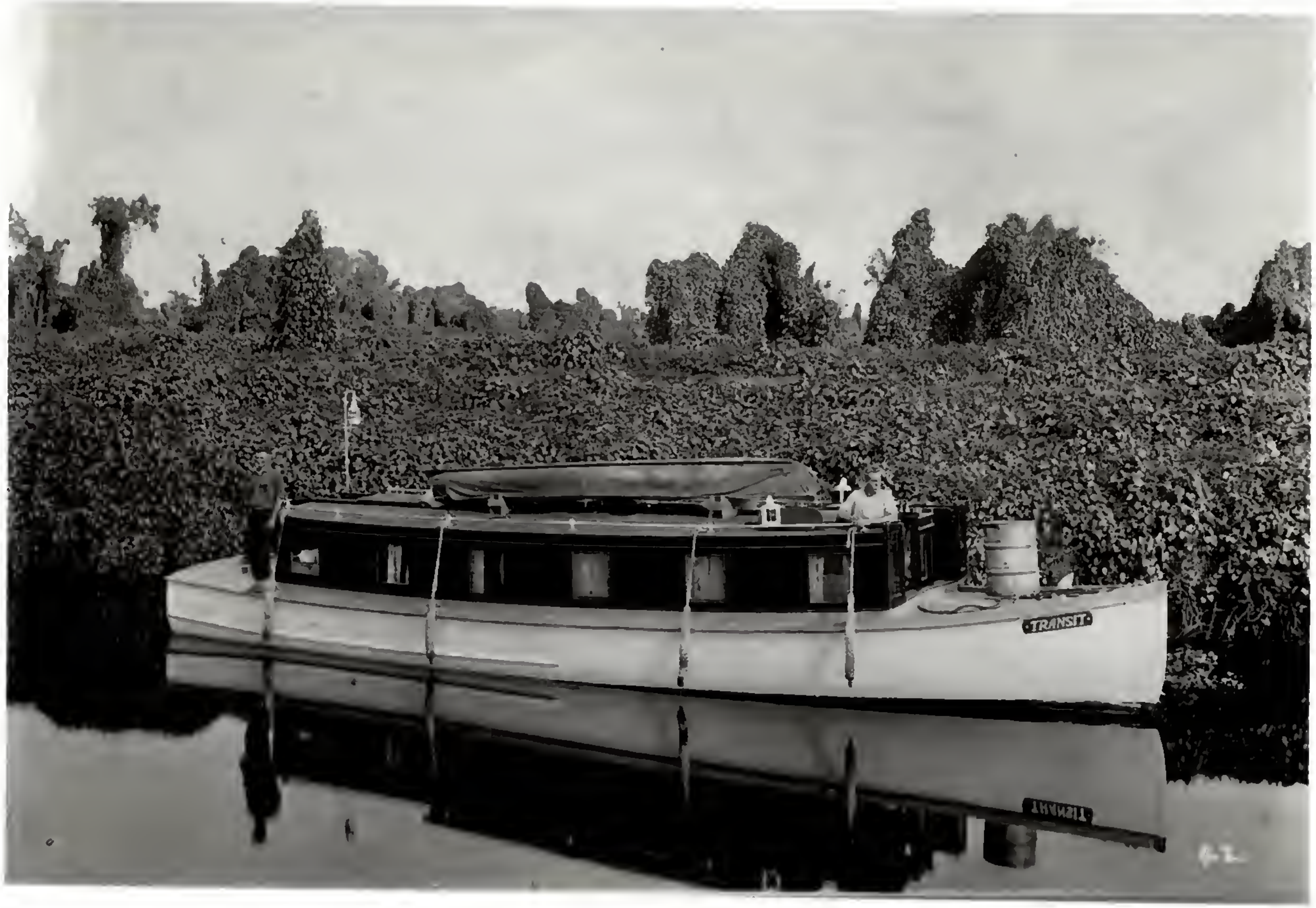

Figure 16. Photograph of moonvine covering vegetation along the Hillsboro Canal near Lake Okeechobee, ca. 1920.
Source: Papers of Fred C. Elliott, Florida State Archives

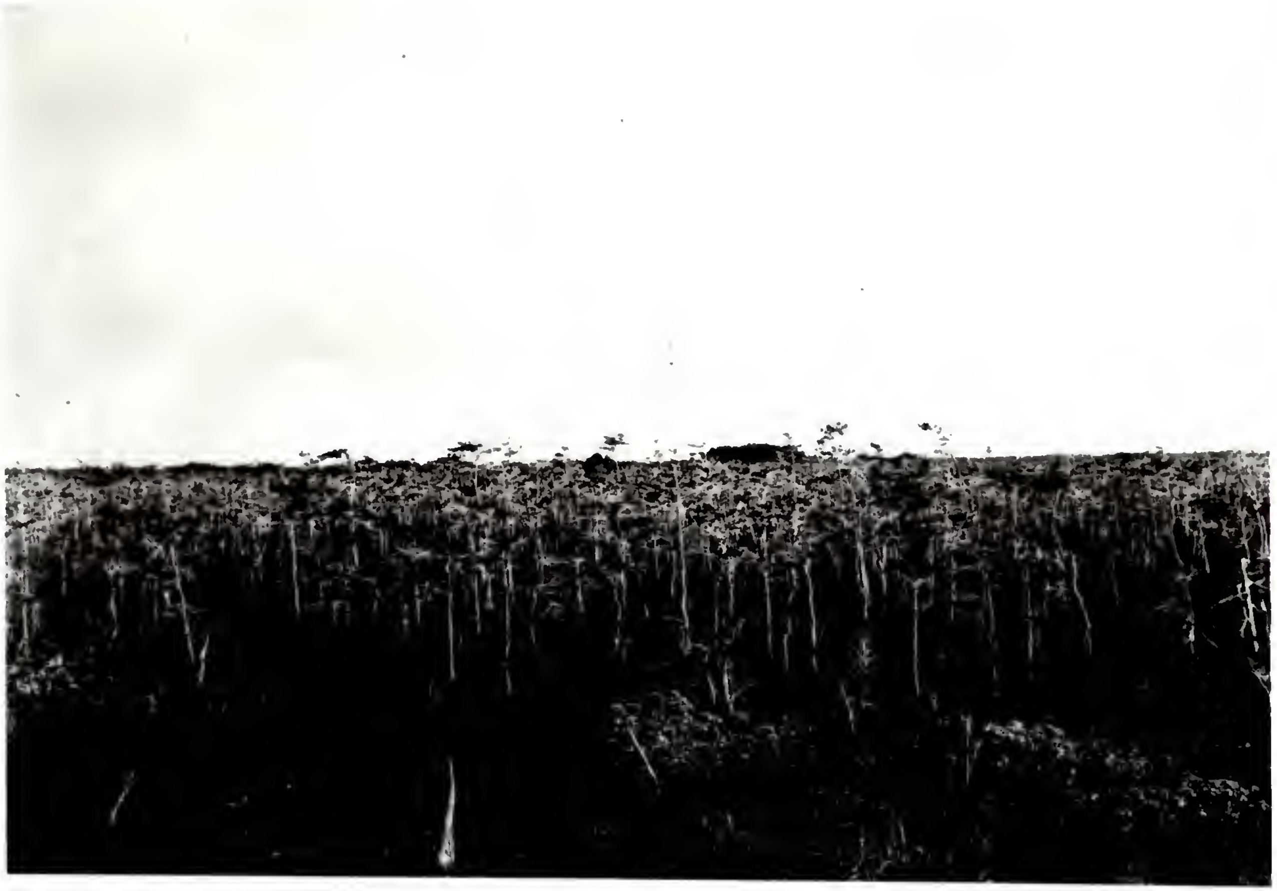

Figure 17. Photograph of dwarf cypress trees in South Florida, April 1925.
Source: John K. Small photograph collection, Florida State Archives.

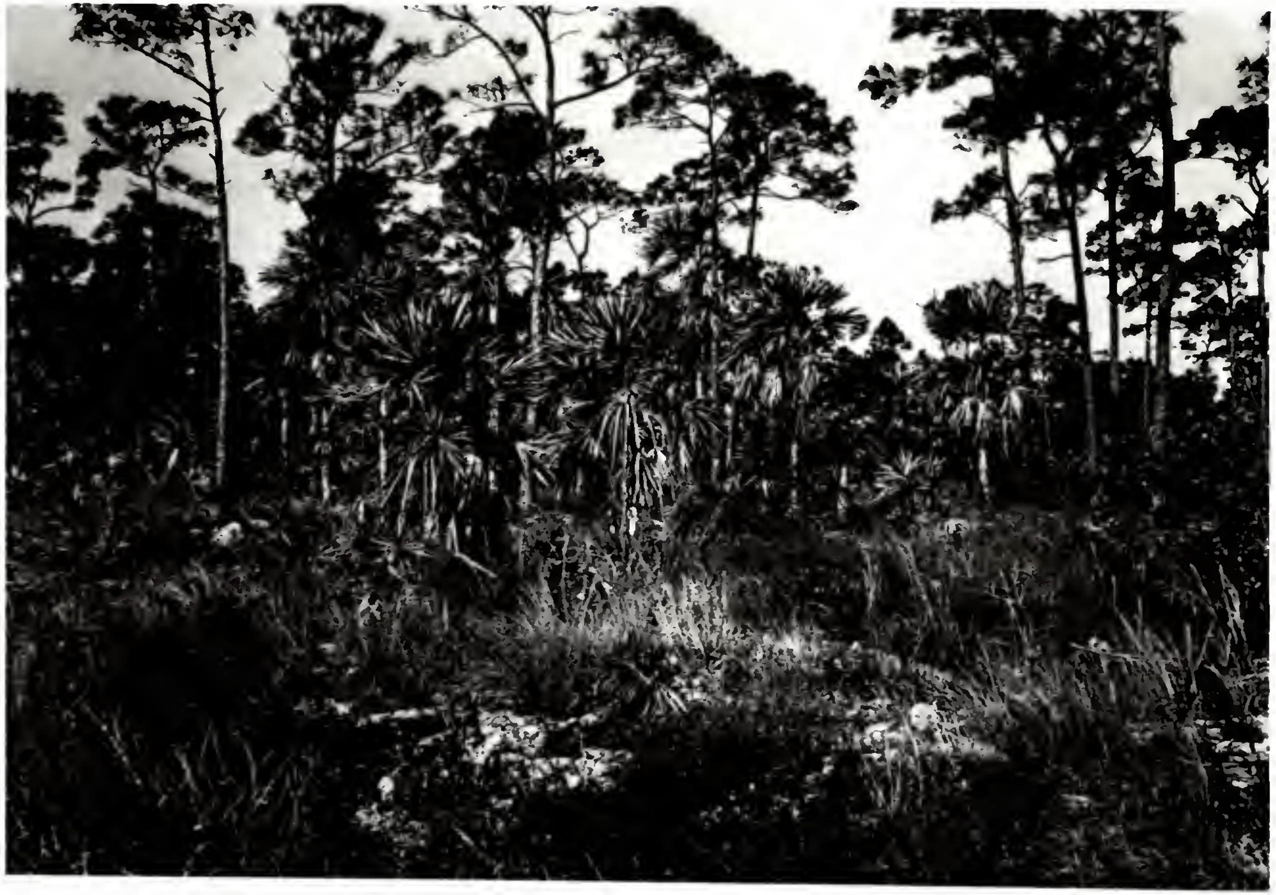

Figure 18. Photograph of vegetation typically found in South Florida's sandy flatlands, February 1916. Source: John K. Small photograph collection, Florida State Archives.

logged, burned or otherwise depleted that it is probably the only about 10 percent contain mature uncut timber." He added that many of those areas are becoming pastures, prairies, and marshes (Figure 19).

The southern and northeastern portions of the trough, as well as the Big Cypress Swamp, are dominated by sloughs, open water, and hammocks or tree islands. A slough is a low lying area, frequently choked with aquatic vegetation, that occasionally contains water even when surrounding places are dry (Loveless 1959; Figure 20). Sloughs are generally relatively narrow (perhaps as narrow as several hundred feet)--although they can be many miles wide--and they frequently have water moving from one end to the other. While traveling through the Big Cypress Swamp shortly after the turn of the century, Stewart (1907 p.17) reported the presence of many sloughs, some dry and others with water in them: "when the sloughs become deep enough, the cypress timber grows and they are called cypress heads or strands."

Craighead (1984) argued for the use of the term "tree islands" to describe relatively small, thickly forested areas surrounded by much shorter vegetation (Figure 21). Since these communities are slightly elevated above the surrounding landscape, many of them have been used by Native Americans as well as by exploring Anglo-Americans as camp sites. Loveless (1959) notes that tree islands can be as small as a quarter of an acre and as large as several hundred acres. In the Everglades proper, drainage of water from north to south gives these islands a tadpole shape with a relatively blunt "head" and thin tail. In other places, tree islands can be circular (Craighead 1984).

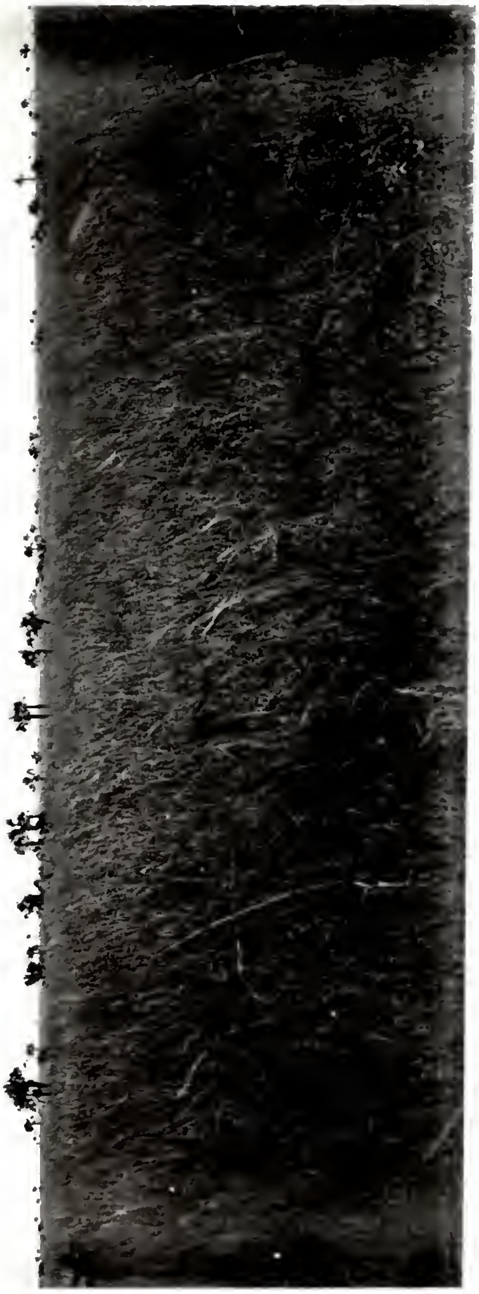

Figure 19. Photograph of South Florida prairie, November 1916.
Source: John K. Small photograph collection.

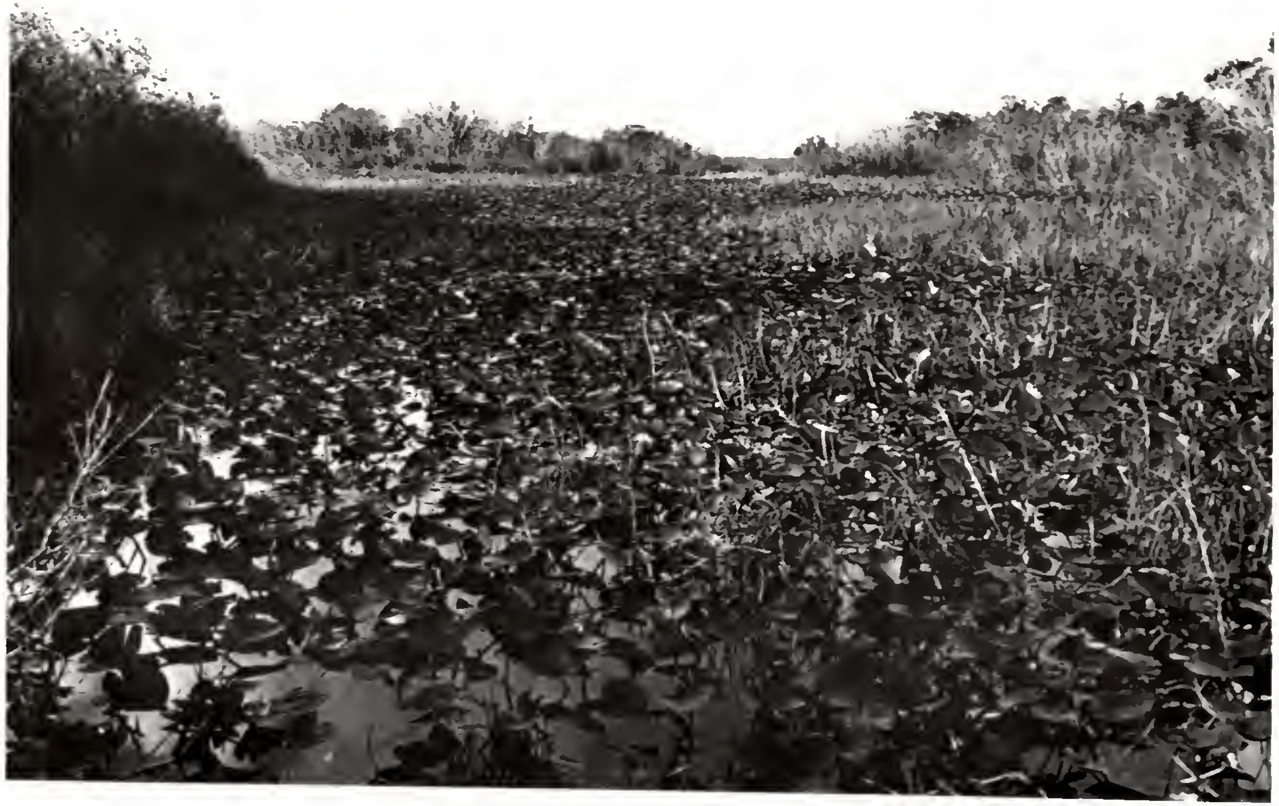

Figure 20. Photograph of a slough in South Florida, January 1916.
Source: John K. Small photograph collection, Florida State Archives.

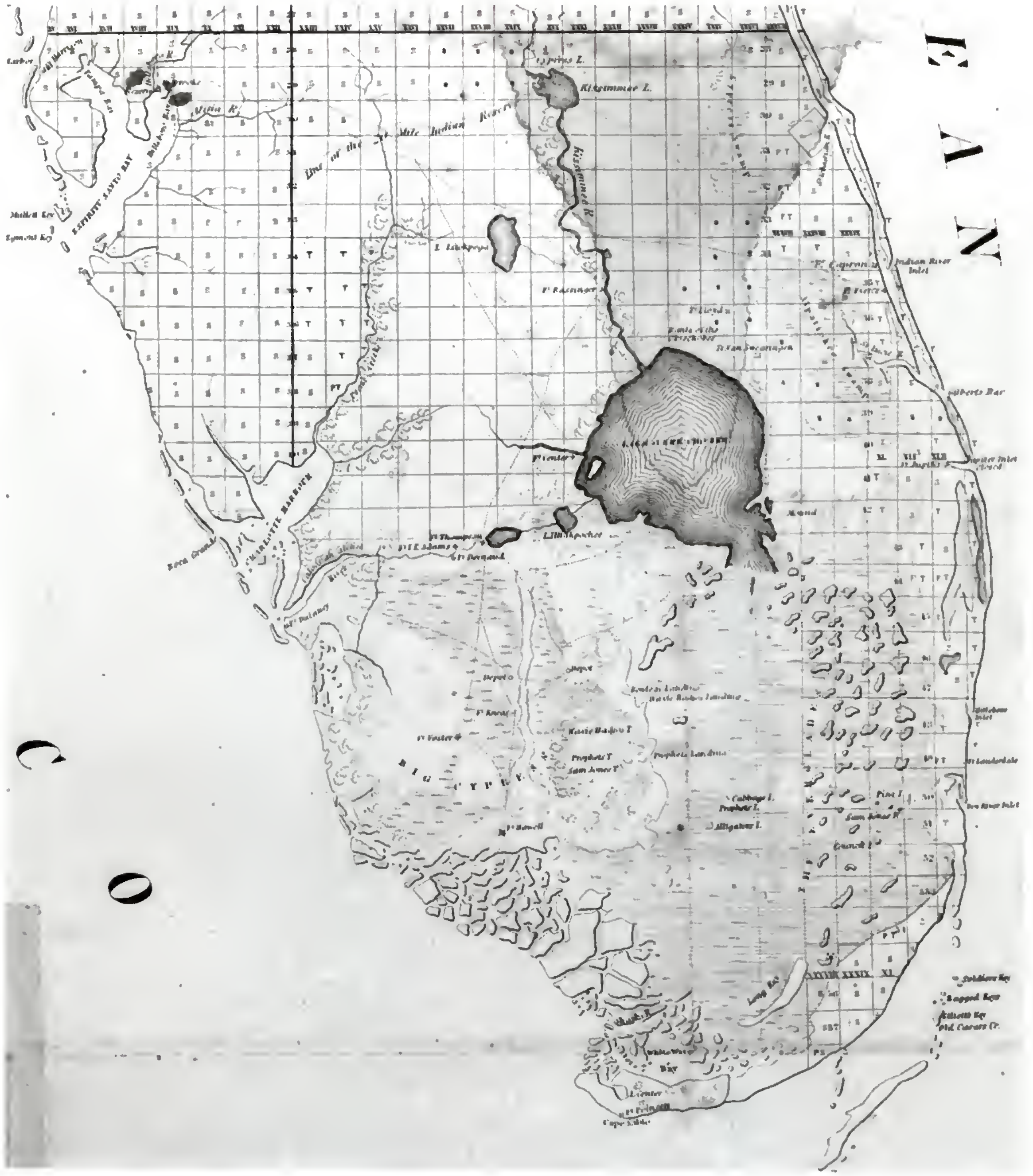

Figure 21. Southern portion of an 1853 map of Florida illustrating the cartographer's view of southwest Florida's 10,000 islands area and tree islands in the Everglades.
Source: University of Florida Map Library

Tree islands are noted for the diversity of plant species that occupy them. As noted by terms such as tropical hardwood hammock, bay head, willow head, royal palm hammock (among others), tree islands can be dominated by different plant associations, many of them tropical. Shrubs, vines, ferns, and epiphytes are also commonly found in tree islands (Figure 22). Unfortunately, some rare ferns and orchids were collectors items and are no longer found in South Florida (Craighead 1984).

The Atlantic Coastal Ridge, more southerly rocklands, and territory a few miles immediately west of these more elevated areas, were dominated by pine flatwoods forests, scrub oaks, and wet prairies. Harshberger's map (Figure 13) illustrates the variety of vegetational associations that once inhabited the eastern rim of the Glades. Pine species in this area vary with slight changes in soil, topography, and water table. Wet prairies are distinguished from marshes by having less water and shorter herbage (Davis 1943a). Much of this vegetation on and near the Atlantic Coastal Ridge has been replaced by urban development.

Closer to Florida's southwest coast, freshwater marshes and cypress trees give way to mangrove swamps and salt water marshes (Figure 4). Salty and brackish water eliminates plant species which are not able to exclude or excrete salt. Salt marshes are dominated by black tipped rushes or different species of spartina grasses or a combination of both. Mangroves are among the few trees that thrive in brackish to salty water (Figure 23). They are tropical trees with little tolerance for cold weather, and once lined the southern coasts of Florida from Fort Myers to Miami, extending in scattered fashion along central Florida's east and west coasts. Immediately off the southwestern coast are

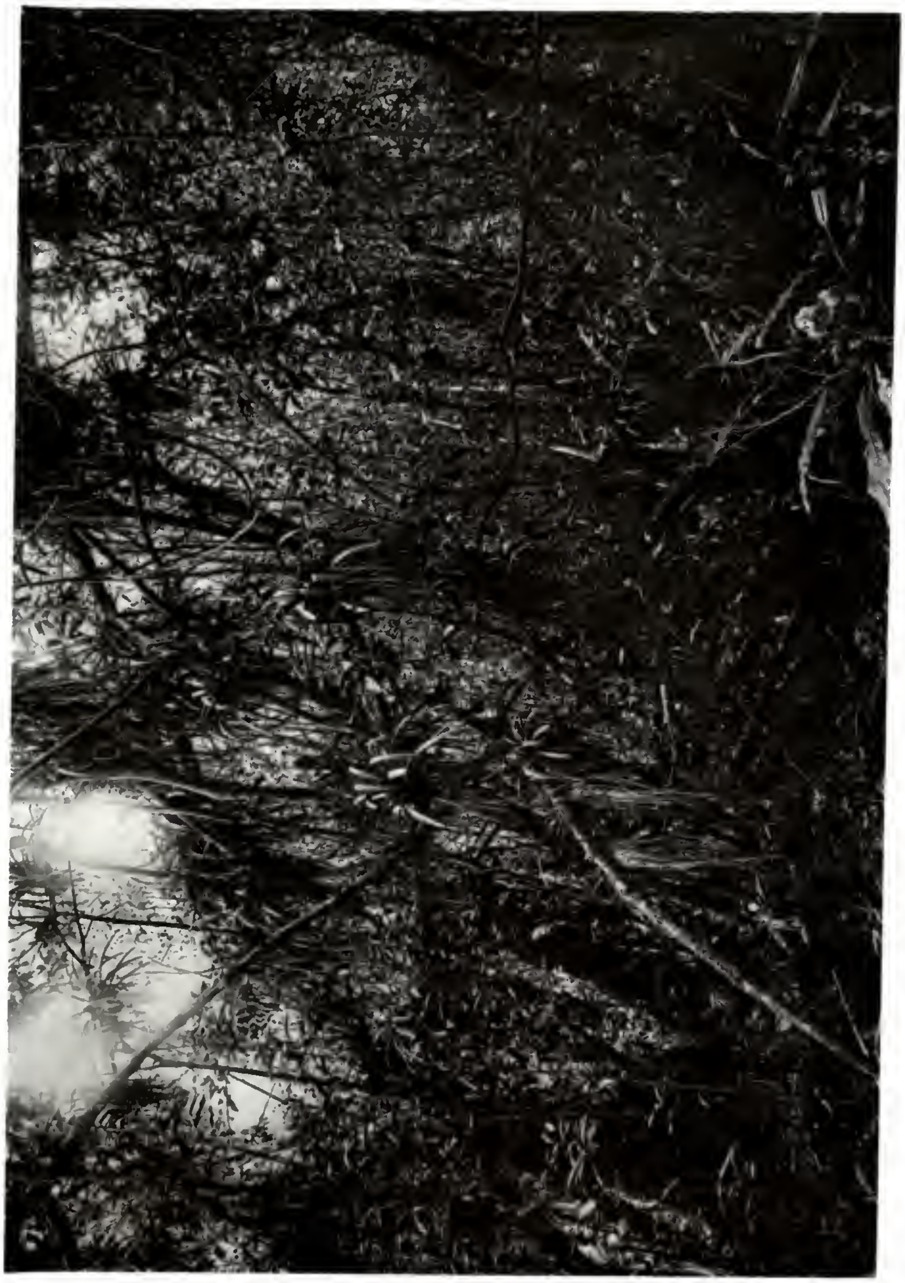

Figure 22. Photograph of vegetation inside a South Florida tree island, January 1916. Source: John K. Small photograph collection, Florida State Archives.

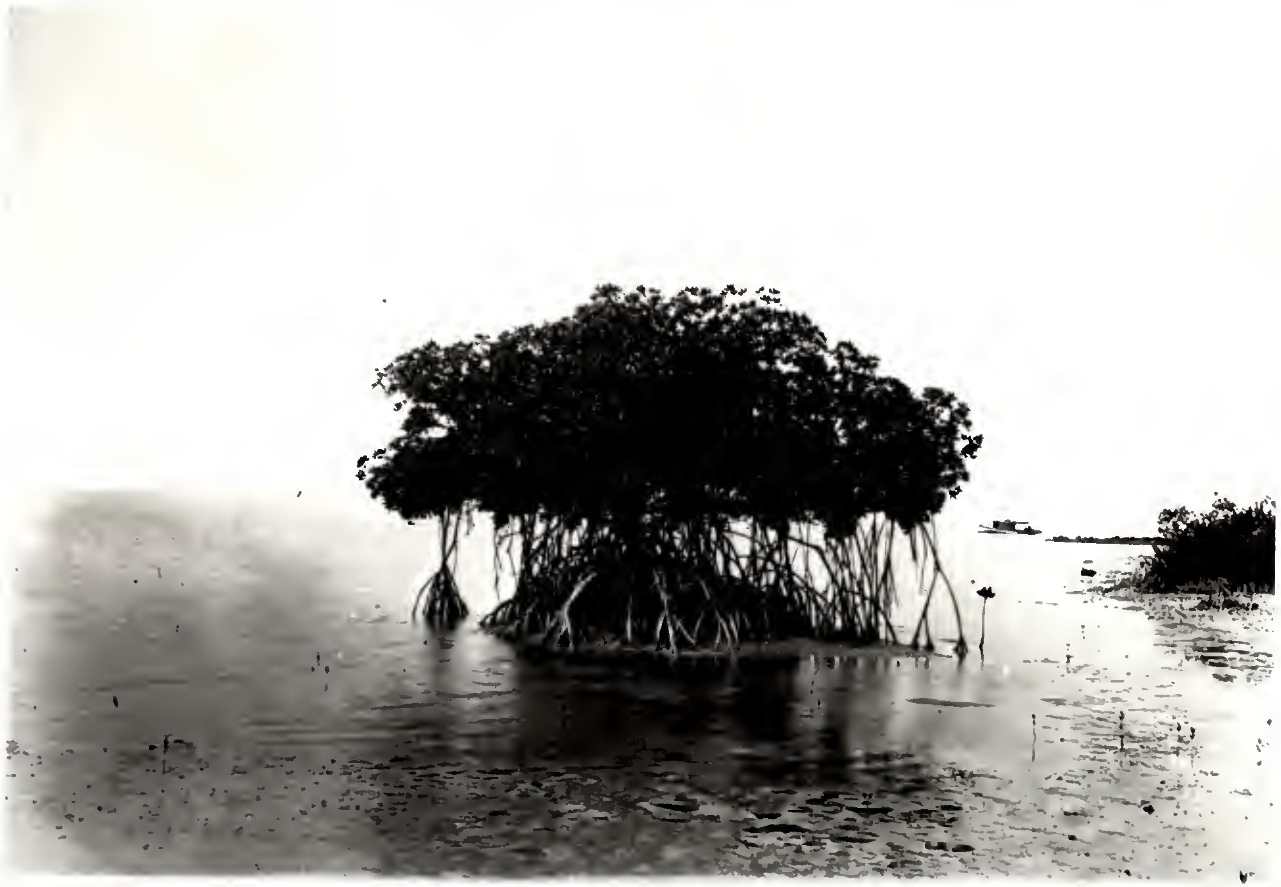

Figure 23. Photograph of a mangrove just of the coast of southwest Florida, February, 1916.
Source: John K. Small photograph collection, Florida State Archives.

the 10,000 Islands--so named because of the myriad of mangrove dominated islands offshore (Figures 4 and 21). Many of these mangrove forests have also fallen victim to South Florida's rampant urban development.

The nature of South Florida's wetlands is related to changes in sea level (Wanless et al. 1994). After the development of the east and west coasts, storm deposits and mangrove peats formed a low coastal dam along Florida's southernmost shore. In 1900, this dam separated the landward freshwater environments from the sea. As Wanless et al. note (1994), however, tide gauge records from southern Florida document a dramatic increase in the rate of relative sea level rise beginning around 1930. The present rapid rise in sea level sets the stage for damaging hurricanes which erode relatively low lying coastal areas that can not be recolonized as mangrove swamp, but turn into deepening, expanding bays. As sea level rises, salt tolerant plants colonize what used to be more inland freshwater wetlands.

Climate

Of all the factors that contributed to South Florida's modern development, climate played a leading role. Yet few elements of southern Florida's physical geography have been as misunderstood. The area south of Lake Okeechobee is still occasionally referred to as "tropical." In fact, the region is a transition zone between the more southerly tropics and more northerly temperate zone. Moreover, although southern Florida's climate is not as variable as that of the Great Plains, there is significant seasonal, annual, and spatial variability in the region's precipitation and, to a lesser extent, its temperature.

Duever et al. (1994) maintain that average daily temperatures show relatively little seasonal change. South Florida summers are warm and winters are only slightly cooler. Average daily maximum temperatures at Belle Glade are consistently above 81 degrees F from April to October. Stations further south maintain the same average maximum temperature from March through November. Average minimum temperatures at Belle Glade from November through March are at least 50 degrees F.

The presence of tropical vegetation in the region has led many observers to believe that cold weather never visits South Florida. Yet it should not be assumed, as it was by many people during the late 19th and early 20th centuries, that freezes never occur in South Florida. During some winters, relatively few cold fronts push south of Lake Okeechobee--and frequently, even these bring cool but not freezing temperatures. In other winters, however, several cold fronts may bring frost.

Minimum temperatures for Belle Glade from 1925 through 1994 have been examined in an effort to illustrate the nature of South Florida's cold weather. Belle Glade was chosen for closer scrutiny because it lies in the heart of South Florida's agricultural community, it has 70 years of record, and it is a few miles from the influence of Lake Okeechobee. Figure 24 shows that Belle Glade is likely to have at least one episode of freezing temperature during any given year. The coldest temperature recorded at Belle Glade for the period of record was 21 degrees F on 12 Jan 1982. Furthermore, Figure 24 also demonstrates that 29 of 70 years had at least one day when the minimum temperature dipped into the 20s F. Finally, Belle Glade's freezing weather is not limited to late December or early January. The earliest freeze during the period of record occurred on 28

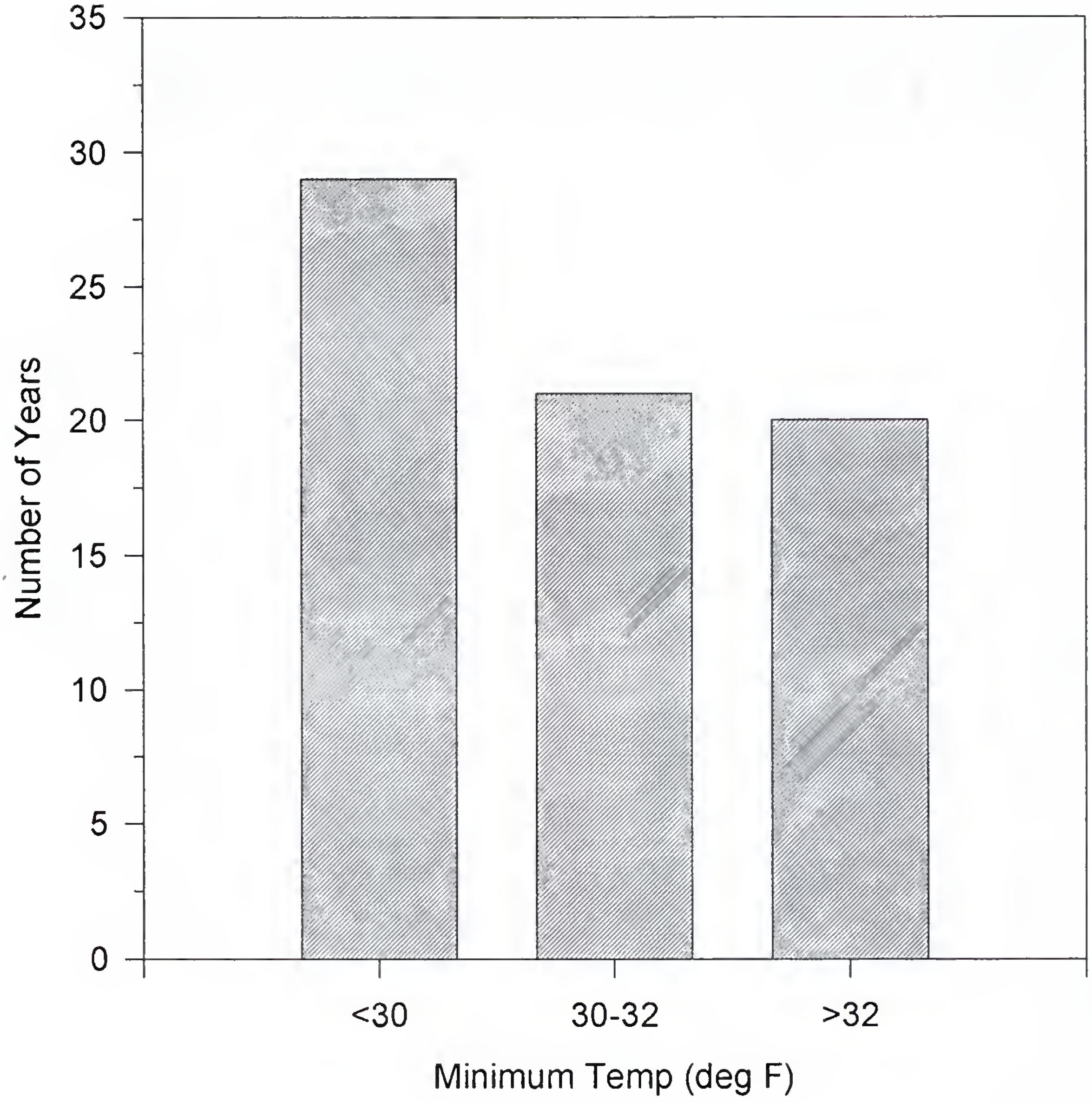

Figure 24. Minimum temperatures, Belle Glade, Florida
1924 - 1994

November; the latest occurred on 14 March. Figure 25 shows that the minimum temperature in any given year is most likely to occur in January, but the years's coldest weather can occur as early as November and as late as March.

Waylen (1988) performed a more comprehensive examination of freezing weather in Florida. He acquired data from stations all over the state including many in South Florida. He shows that coastal locations are less likely to experience freezing temperatures. For example, Ft. Myers had only nine frosts in 42 years of record. On the east coast, the Miami airport had only one frost in 28 years of record; yet Homestead--20 miles south of Miami, but a few miles further inland--experienced 25 frosts in 50 years. Clearly, coastal locations are buffered (to a certain extent) from freezing weather.

Although early South Florida pioneers did not have access to such data, there were warning signs. For instance, the experiment station at Miami had abandoned many tropical fruits by 1907 due to cold weather (Stewart 1907). Some of this cold weather came in December 1906. Stewart (1907) reported that this freeze caused substantial damage to young citrus trees along the Caloosahatchee River. Moreover, the *Miami Metropolis* reported on 28 February 1908 that although there was no apparent freeze damage in Miami, overnight temperatures had dipped to 28 degrees F at Ft. Lauderdale. Unfortunately, many early Glades settlers neglected the ocean's influence and assumed that the Everglades were equally unlikely as the coast to experience frost. Those who settled along the Bolles Canal--five to six miles south of Lake Okeechobee (Figure 5)--discovered that their farms were more vulnerable to frost damage than were lakeshore farms.

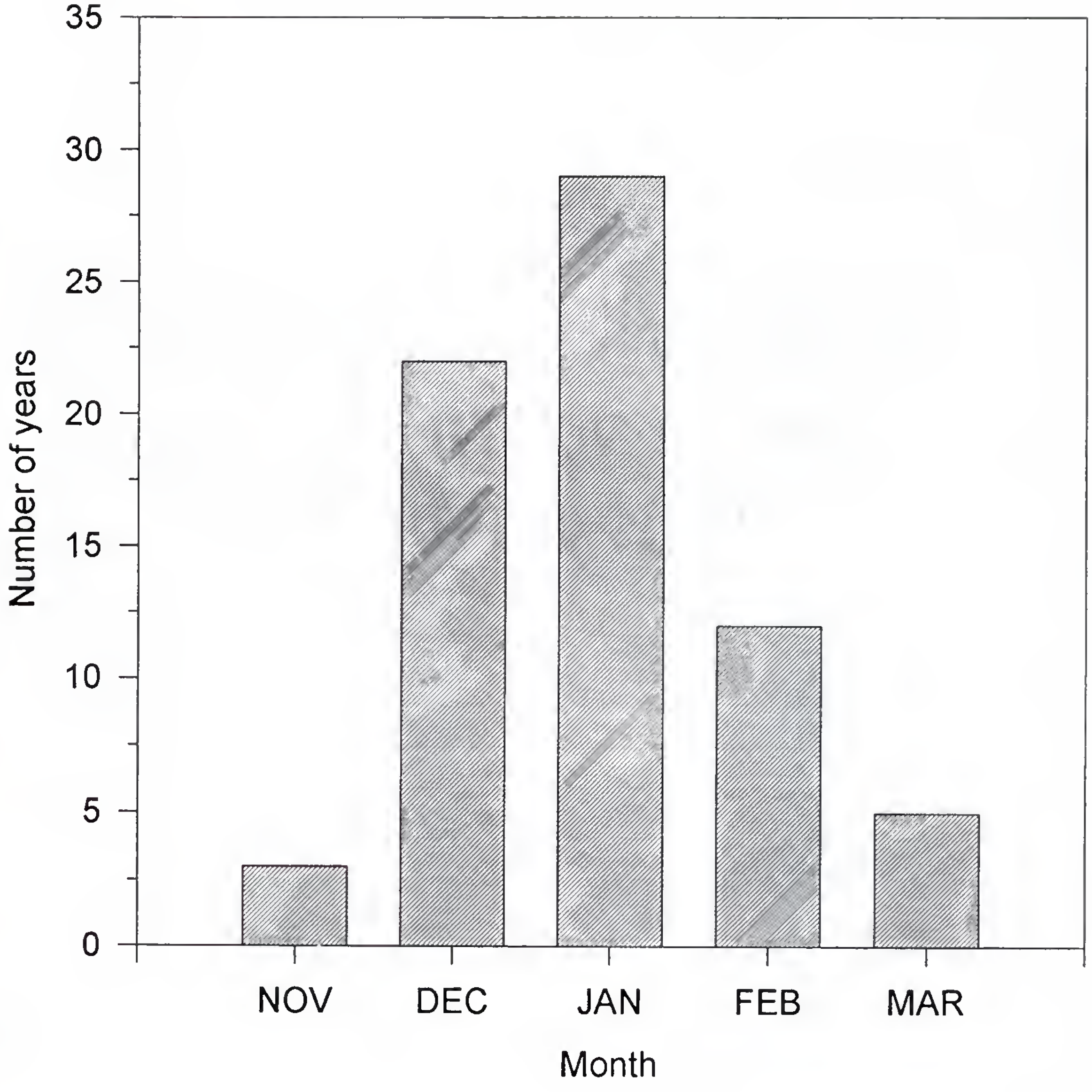

Figure 25. Month of minimum temperature occurrence, Belle Glade, Florida
1924 - 1994

For tropical vegetation in South Florida, occassional freezing temperature is only one impediment to survival. Also of consequence is the duration of sub-freezing temperature, the frequency of freezes within a single winter, and the condition of the vegetation at the time of a freeze. Periodic episodes of cold weather in South Florida kill many species and stunt the growth of others. According to Duever et al. (1994 p.238), "this mix of factors is at least part of the reason for the occurrence of spatially different effects of a single freeze event in South Florida, as well as different effects of different freeze events at the same site."

In addition to temperature, precipitation in South Florida shares characteristics typical of many tropical areas. Mean annual precipitation at most South Florida stations is between 53 and 61 inches; some years may receive less than 40 inches of rainfall while other years occasionally have 80 inches or more (Figures 26 through 31; stations identified in Figure 3). Stations along Florida's southeast coast (West Palm Beach, Ft. Lauderdale, and Miami) usually receive slightly more rainfall than inland stations (Tamiami Trail at Forty-Mile Bend and Belle Glade). This is due to the Bermuda high pressure cell which generates warm and humid southeasterly winds which first reach stations along Florida's lower east coast. Despite its coastal location, even Ft. Myers falls in the "rain shadow" of Florida's southeast coast.

Precipitation in South Florida is seasonal. Duever et al. (1994) found that 60% of the region's rainfall occurs from June through September, the "wet" season. Precipitation during the wet season at these stations averages between six and nine inches per month. This can be seen in Figures 32 through 37 which show mean monthly precipitation in

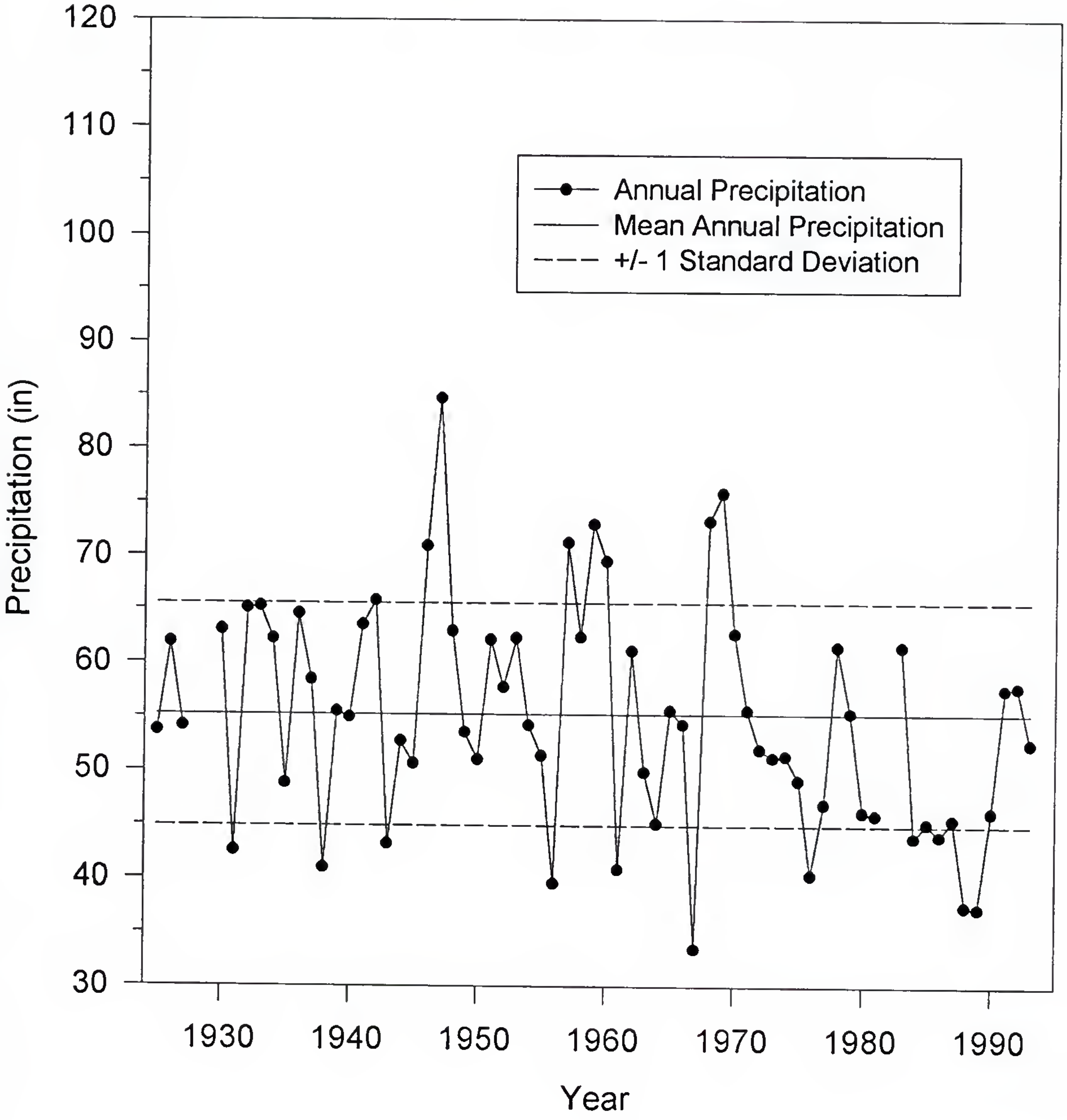

Figure 26. Annual Precipitation, Belle Glade, Florida
1924 - 1993

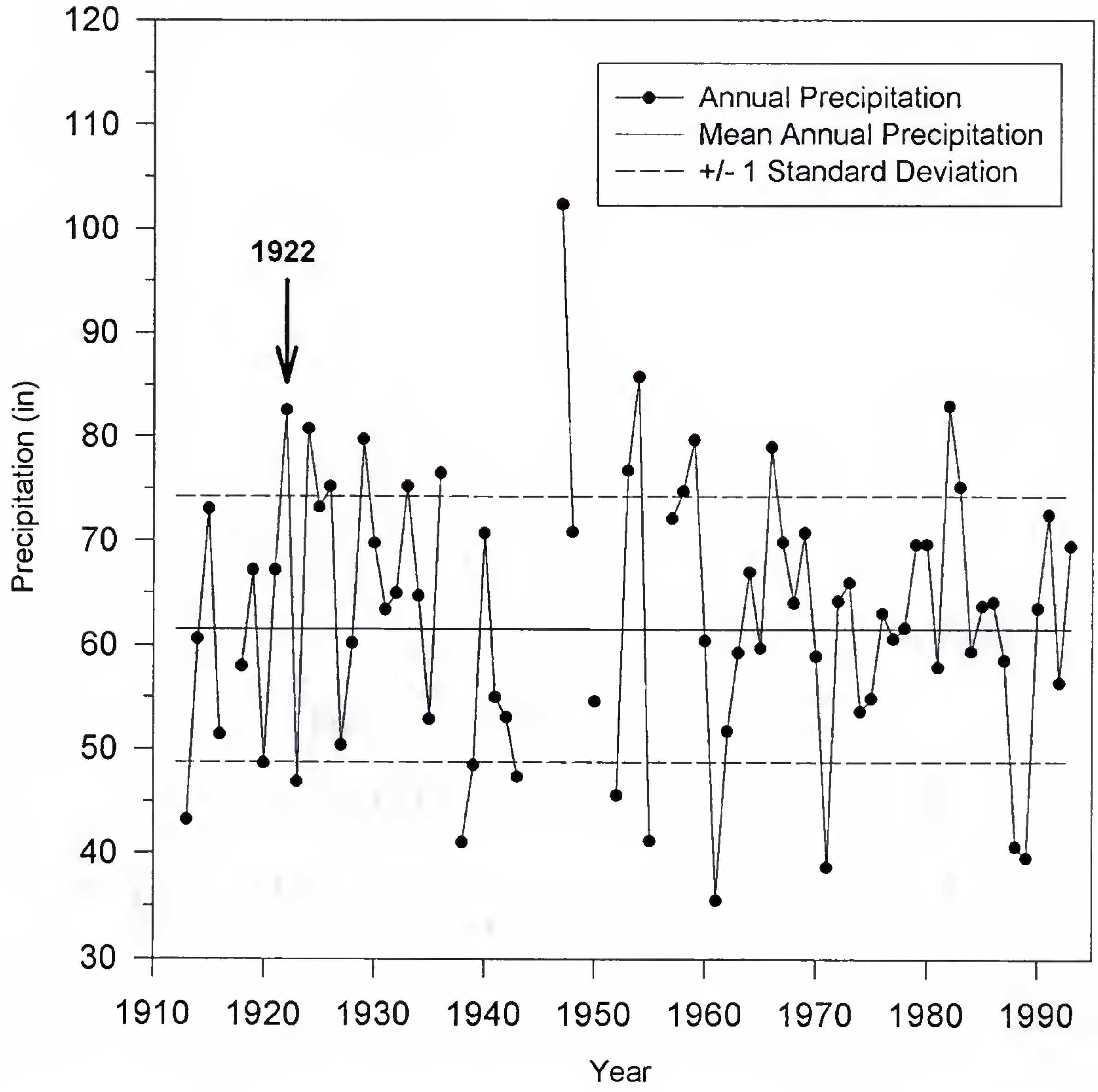

Figure 27. Annual precipitation, Ft. Lauderdale, Florida
1913 - 1993

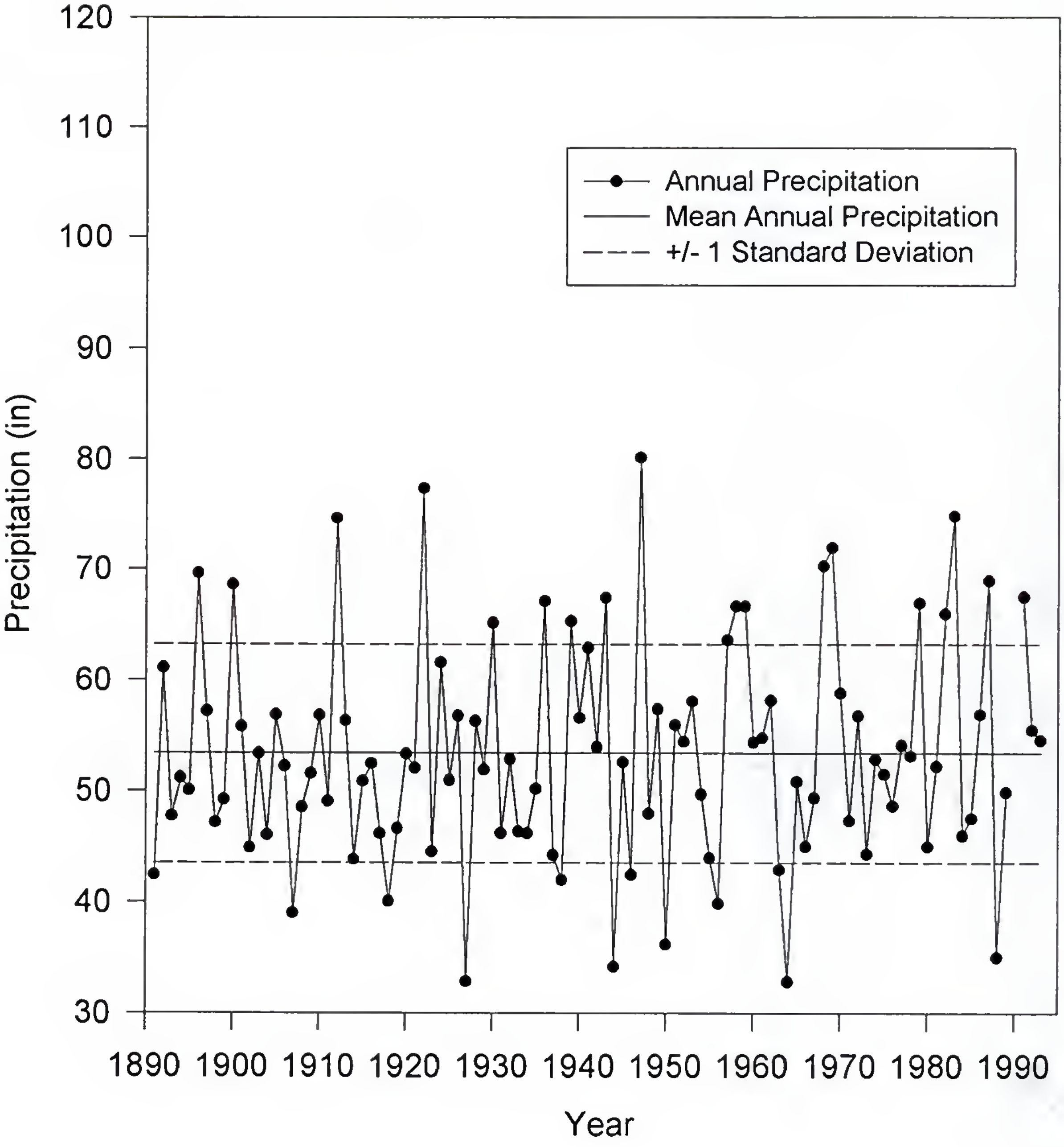

Figure 28. Annual precipitation, Ft. Myers, Florida
1891 - 1993

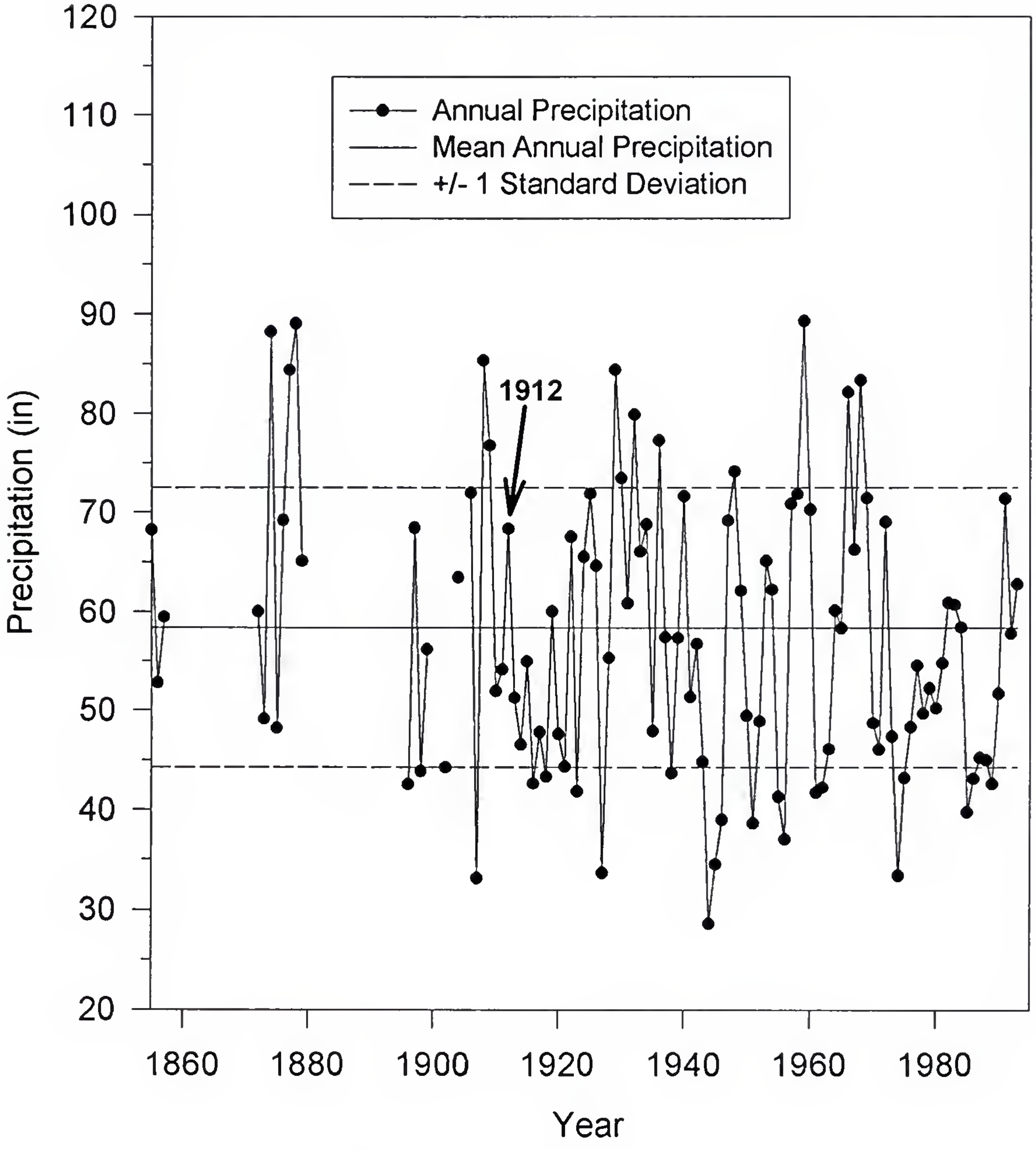

Figure 29. Annual precipitation, Miami, Florida
1855 - 1993

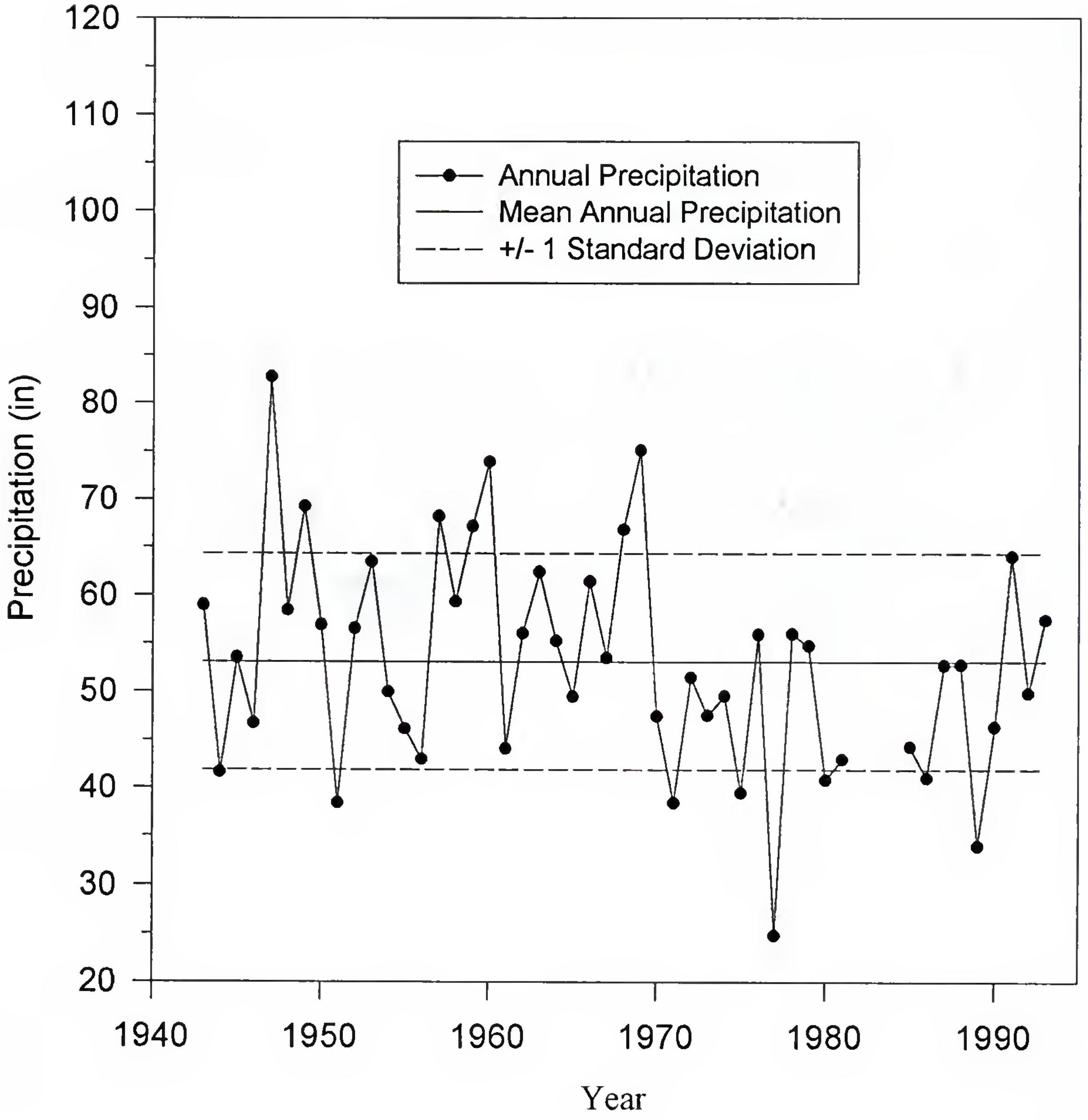

Figure 30. Annual precipitation, Tamiami Trail at Forty Mile Bend, Florida
1943 - 1993

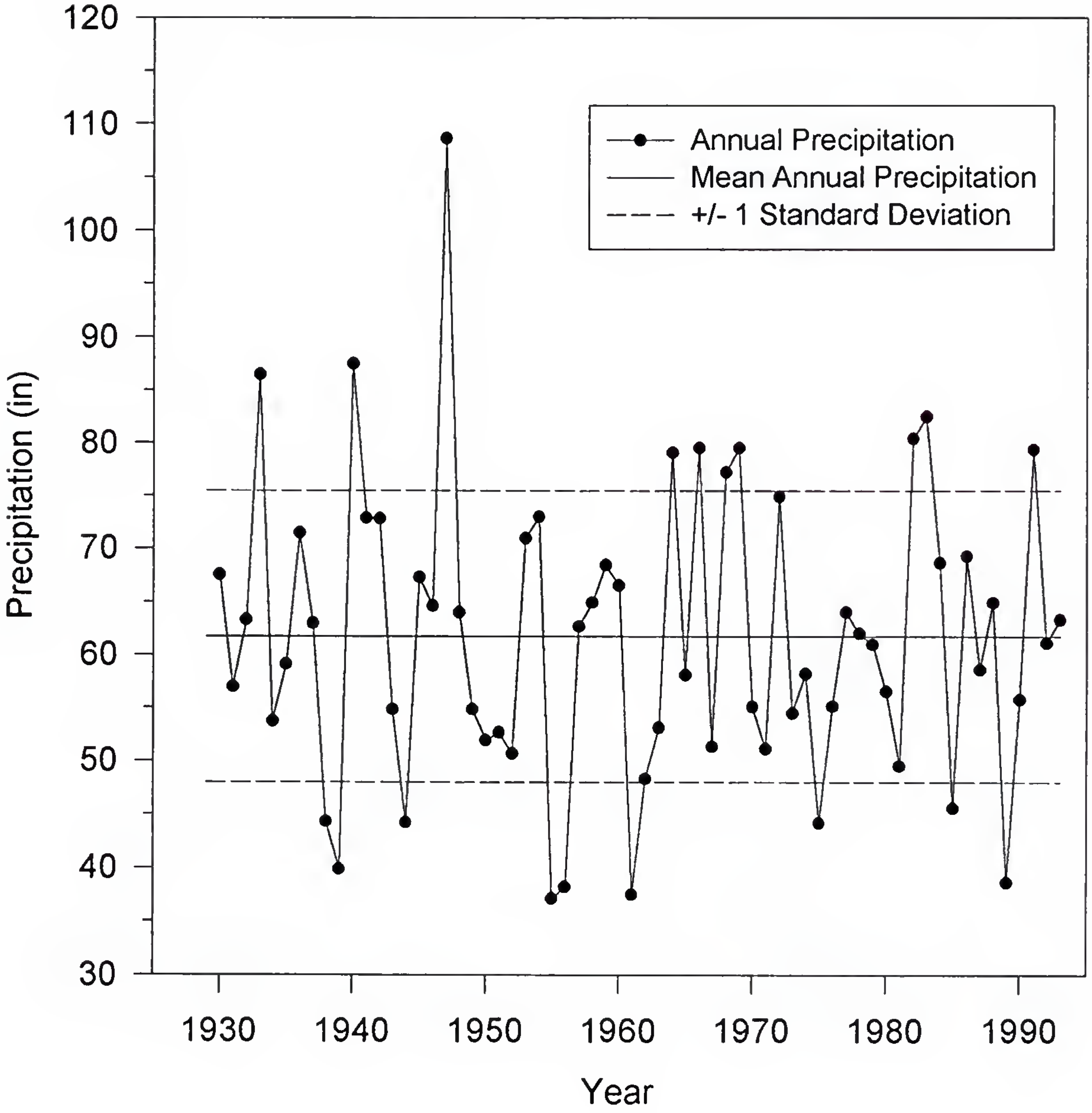

Figure 31. Annual precipitation, West Palm Beach, Florida
1929 - 1993

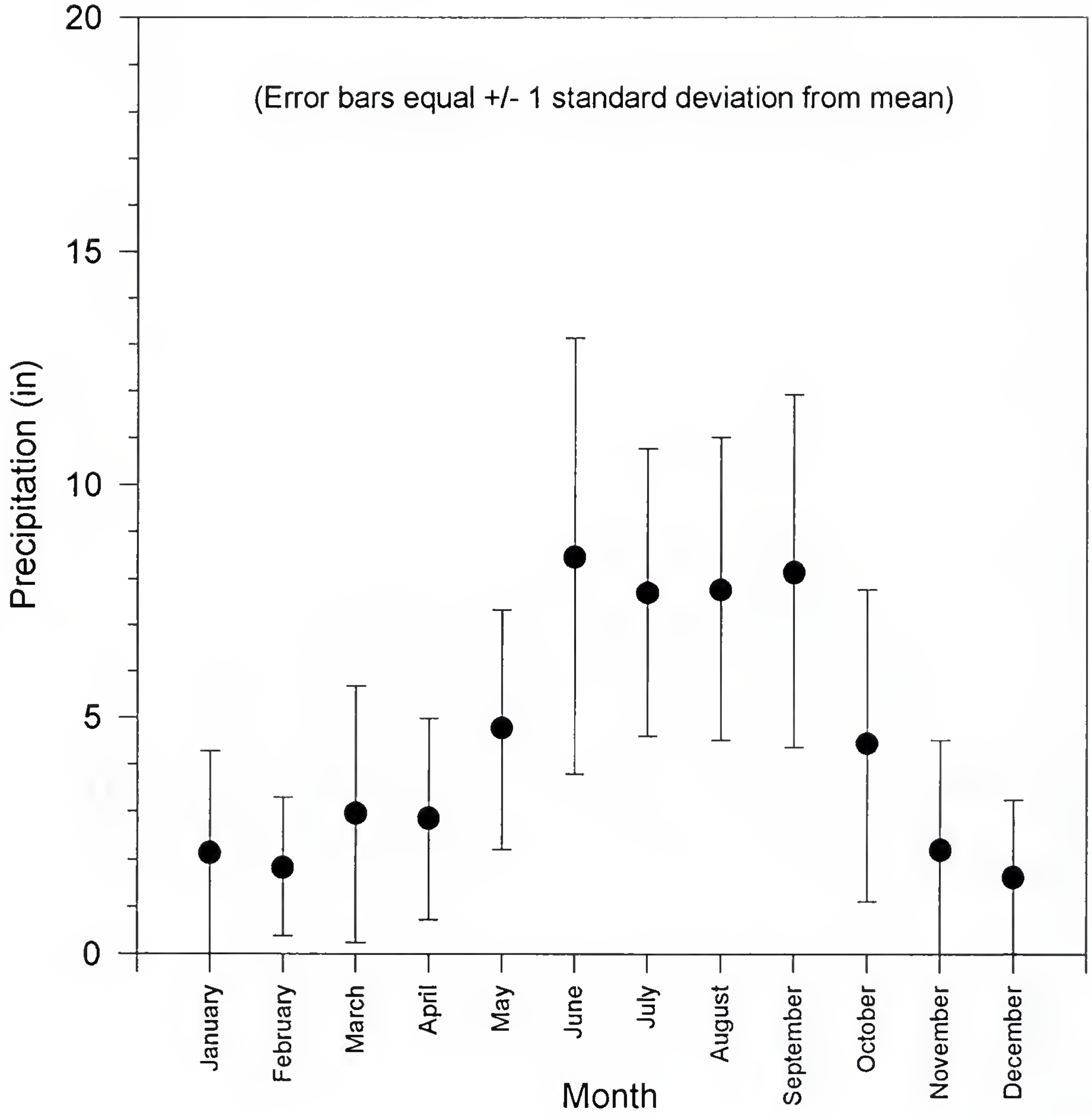

Figure 32. Mean monthly precipitation, Belle Glade, Florida
1924 - 1993

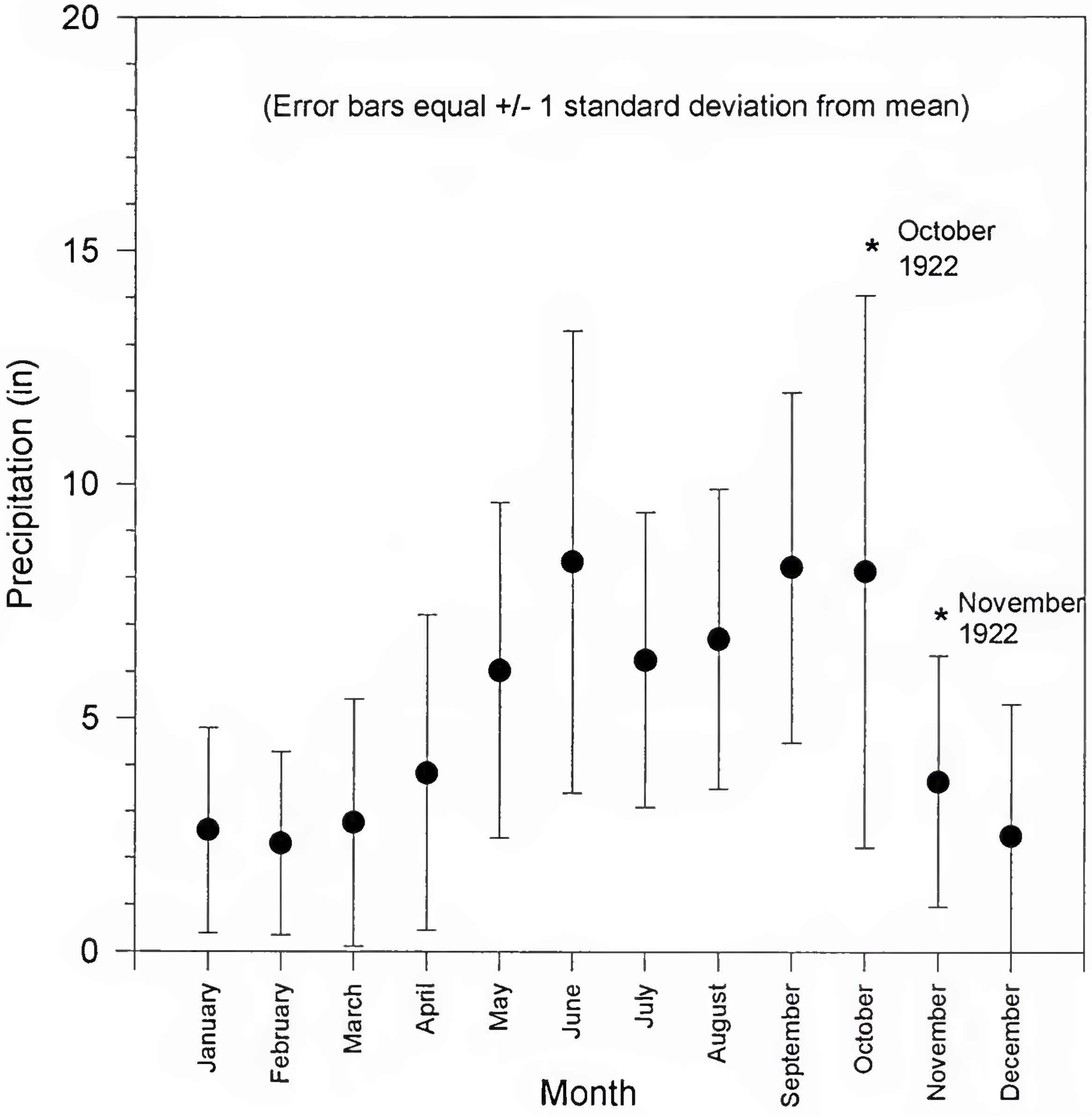

Figure 33. Mean monthly precipitation, Ft. Lauderdale, Florida
1913 - 1993

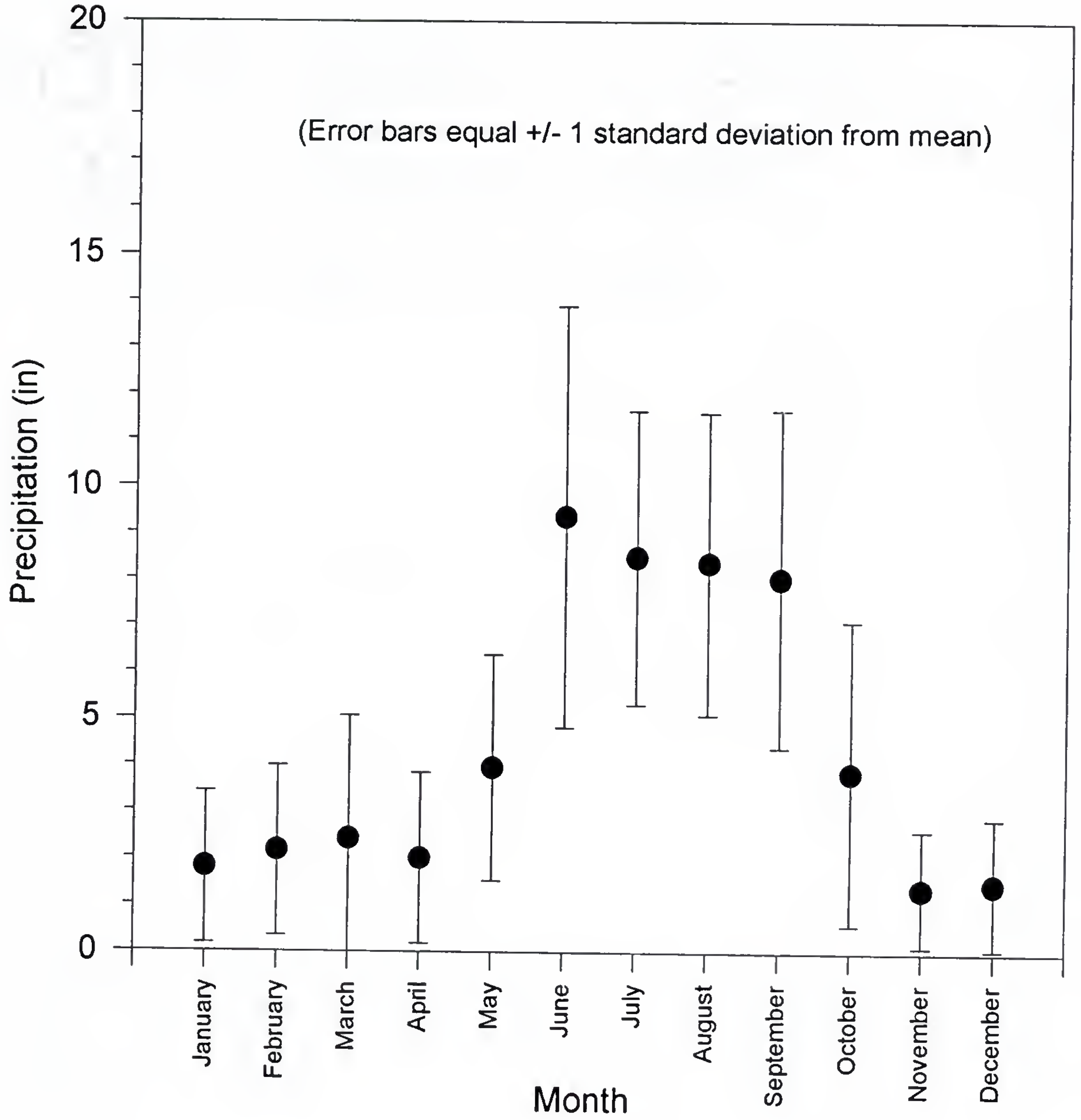

Figure 34. Mean monthly precipitation, Ft. Myers, Florida
1891 - 1993

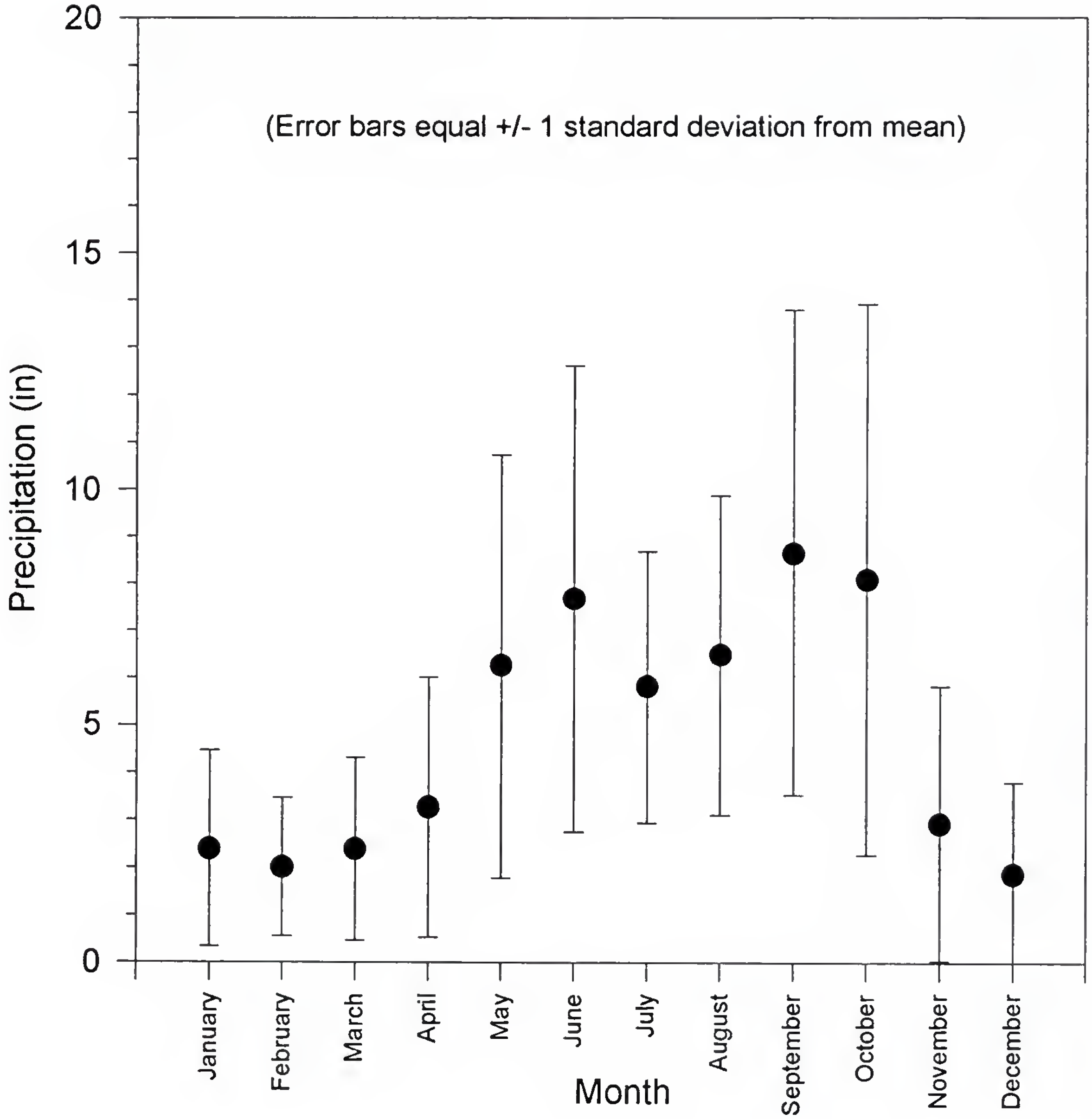

Figure 35. Mean monthly precipitation, Miami, Florida
1855 - 1993

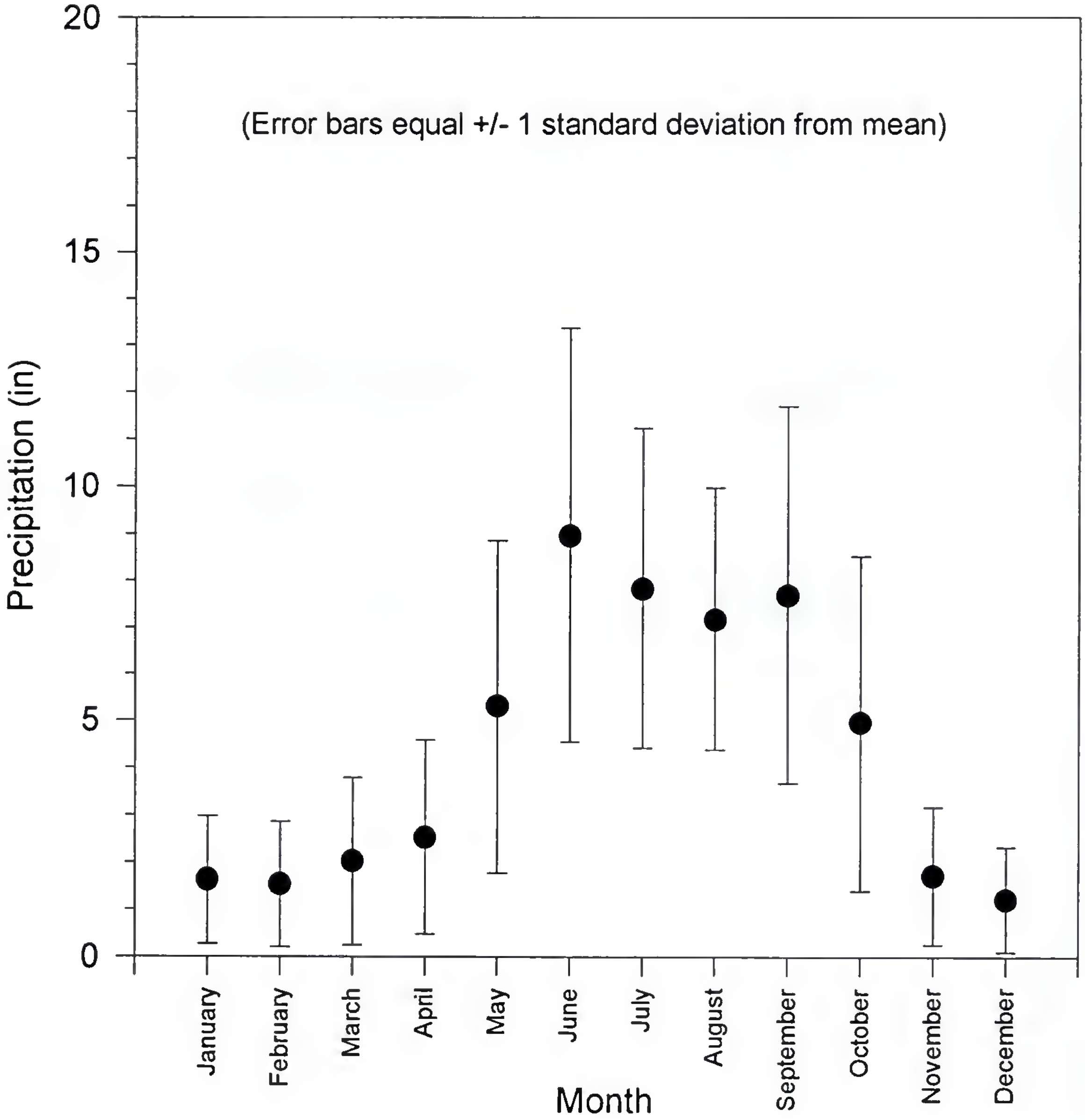

Figure 36. Mean monthly precipitation, Tamiami Trail at Forty mile Bend, Florida 1943 - 1993

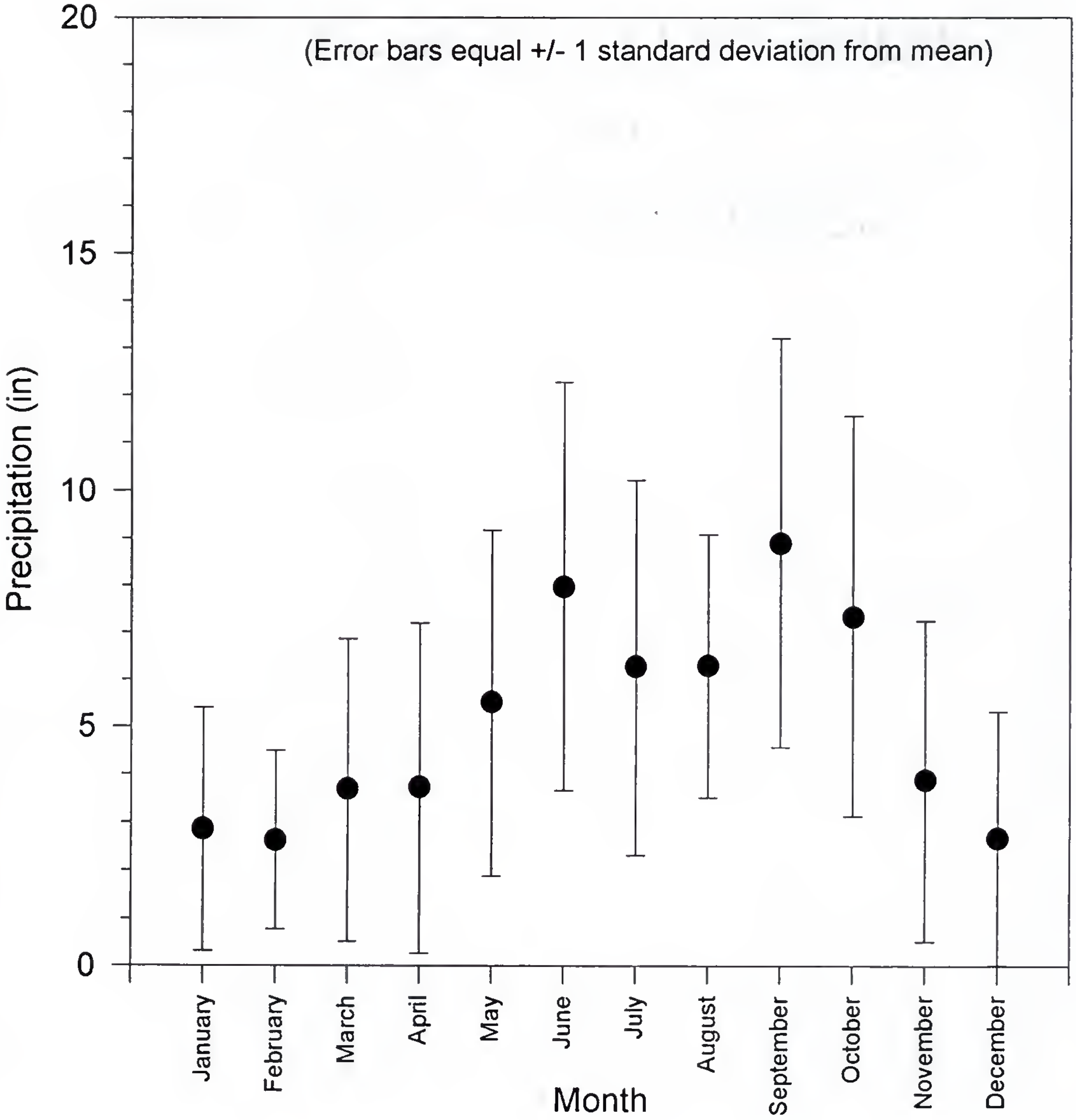

Figure 37. Mean monthly precipitation, West Palm Beach, Florida
1929 - 1993

addition to bars extending one standard deviation on both sides of the mean. Assuming the region's rainfall data are normally distributed, two-thirds of all observations for any given month occur within one standard deviation of the mean. Wet season precipitation comes chiefly from two sources. First, convective thunderstorms are common because of the intense heating of this nearly tropical landscape. Moreover, these storms are unevenly distributed across time and space. The second source, sea breezes, are highly correlated with variations in the location and timing of convective activity (Henry et al. 1994). According to Henry et al. (1994 p.105), "as the sea breeze advances inland, a zone of convergence--air from different directions coming together--forms near the leading edge of the land-penetrating ocean air."

Only 25% of the region's annual precipitation falls between November and April, the "dry" season. Figures 32 through 37 illustrate this pattern. Rainfall during the dry season generally averages between two and three inches per month. Rainfall variation during the dry season months of January and February is not as great as during the wet summer months (the standard deviation bars are longer for the summer months). Still, there is some variability. Although dry season months with approximately ten inches of rainfall are rare, these months occasionally receive between five and six inches of precipitation. Dry season rainfall, which occurs during the winter and early spring months, can come from invasions of warm maritime air, or from cold fronts from the north. May and October are transition months between seasons, so they may be either dry or wet.

October falls within tropical cyclone and hurricane season. These storms are more likely to strike South Florida than any other part of the United States (Gentry 1984).

Thirty percent of the tropical cyclones that affect Florida occur during October, 31% during September, and 18% during August; the remaining 21% are scattered between June, July and November (Gentry 1984). Storm surges generally have little affect on the Glades, but wind damage can be substantial. According to Gentry (1984), tropical storms passing over a station frequently drop between 5 and 10 inches of rain in a day or so, but heavier rains can occur. Torrential rains may cause tremendous flooding, especially when one or more tropical cyclones occur after an unusually wet summer. Conversely, if such storms pass at the end of a particularly dry summer, they may provide much needed water. Tropical cyclones contribute considerable amounts of precipitation during some years, but very little or none during others. Since convective activity slackens during October, the presence or absence of tropical cyclones accounts for much of the variation in South Florida's October rainfall.

Evapotranspiration (ET) is an important factor in South Florida because it is the primary mechanism by which water leaves the region (Duever et al. 1994). Dohrenwend (1977) produced rough estimates of potential and actual ET for the entire state. He suggests that potential ET for South Florida is approximately 50 inches per year, but that actual ET is probably closer to 40 inches per year. The reason for this discrepancy is water availability, and this sets the stage for a discussion of drought.

Wet season rainfall usually more than compensates for high ET rates. With the onset of the dry season during the fall and winter months, water levels decline slowly because temperatures drop and vegetative consumption of water is reduced. With the arrival of spring, however, temperatures increase along with increased vegetative demand for water. Because rainfall is comparatively low at this time, there is usually a rapid decline in the water table. Warm summer months that have unseasonably low amounts of precipitation cause severe environmental stress. Yet as Duever et al. (1994 p.241) point out, “the great spatial and temporal variability in South Florida rainfall results in great spatial and temporal variability in droughts or even normal dry season water levels.”

Summary

These were the approximate characteristics of the physical environment experienced by South Floridians during the late 19th and early 20th centuries. Since relatively few people lived in southern Florida before the 1890s, people were unaware of the region’s potential for frost. In addition, since relatively few people (other than Native Americans) ventured into the Glades prior to the 1890s, there was widespread ignorance regarding the region’s soils, vegetation, and hydrology. This lack of awareness eventually led many to believe that the Glades could be drained quickly and inexpensively. As misconceptions regarding the region’s physical geography slowly became exposed, there developed a growing number of people who questioned the State’s relatively simple reclamation plan.

CHAPTER 4
PERCEPTIONS OF THE EVERGLADES FROM 1895 TO 1912

David Lowenthal (1985 p.xxii) maintains that the past is gone and "all that survives are its material residues and the accounts of those who experienced it." We can never completely understand what the past was like, he continues, because "its survival on the ground, in books, and in our heads is selectively perceived from the start and further altered by the passage of time." Nowhere is this more true than with the Everglades where within a century, American settlement has radically altered the landscape.

The next two chapters include an analysis of materials which provide insight into people's perceptions of the Glades from the 1890s to 1930. Chapter 4 covers the period from the 1890s to 1912. It was during this period that settlement along southeast Florida began in earnest; and that people began to view the Everglades as an area of potential settlement. Furthermore, the years 1909 to 1912 mark a brief period of intense, nation-wide interest in Everglades drainage. The years 1912 to 1930 are the subject of Chapter 5. This chapter is an examination of the mood of pioneers, northern investors, residents of Florida's lower east coast and others, as people began to carve settlements near the south shore of Lake Okeechobee. During this time, Southeast Florida experienced a brief land boom while the Glades were plagued by several incidents of severe flooding. Also during this period, hurricanes struck South Florida and helped fuel mounting apathy regarding Everglades development.

Perceptions of environments during any time period are derived, at least in part, from previous experience with that environment. Yet the Everglades remained virtually unknown to most Americans until 1835, when the U.S. Army arrived in Florida to forcibly move Seminole Indians to Oklahoma. Seminoles resisted by using guerrilla tactics and moving into South Florida's relatively inaccessible Everglades (Figure 38). The Army rounded up all but a few hundred Native Americans in southern Florida by 1842 when officials in Washington declared the war over. Relatively minor skirmishes in the middle 1850s led to the removal of 150 more Indians (Tebeau 1980).

The Army learned a great deal about the Everglades as a result of its missions through South Florida, but most of this knowledge remained buried in maps and reports prepared by soldiers (Tebeau 1974). Furthermore, despite glowing reports of the Glades by several Army officers who served in the region (U.S. Senate 1911), there were still plenty of fertile uplands in other parts of Florida and the United States. Hamilton Disston tried to develop central and southern Florida during the 1880s, but his activities ground to a halt by the early 1890s. Since relatively few people lived in southern Florida prior to the 1895, the arrival of railroads into this region during the 1890s is a logical point to begin the study.

Frederick Jackson Turner (1894) declared the American frontier had ended in 1890, but much of Florida remained a virtual wilderness. Florida had less than 400,000 residents in 1890, and most of them lived in the northern part of the state. Tebeau (1974) notes that even by 1900, less than 44,000 people lived south of a line from Cape Canaveral to Charlotte Harbor (Figure 1). According to the 1890 census:

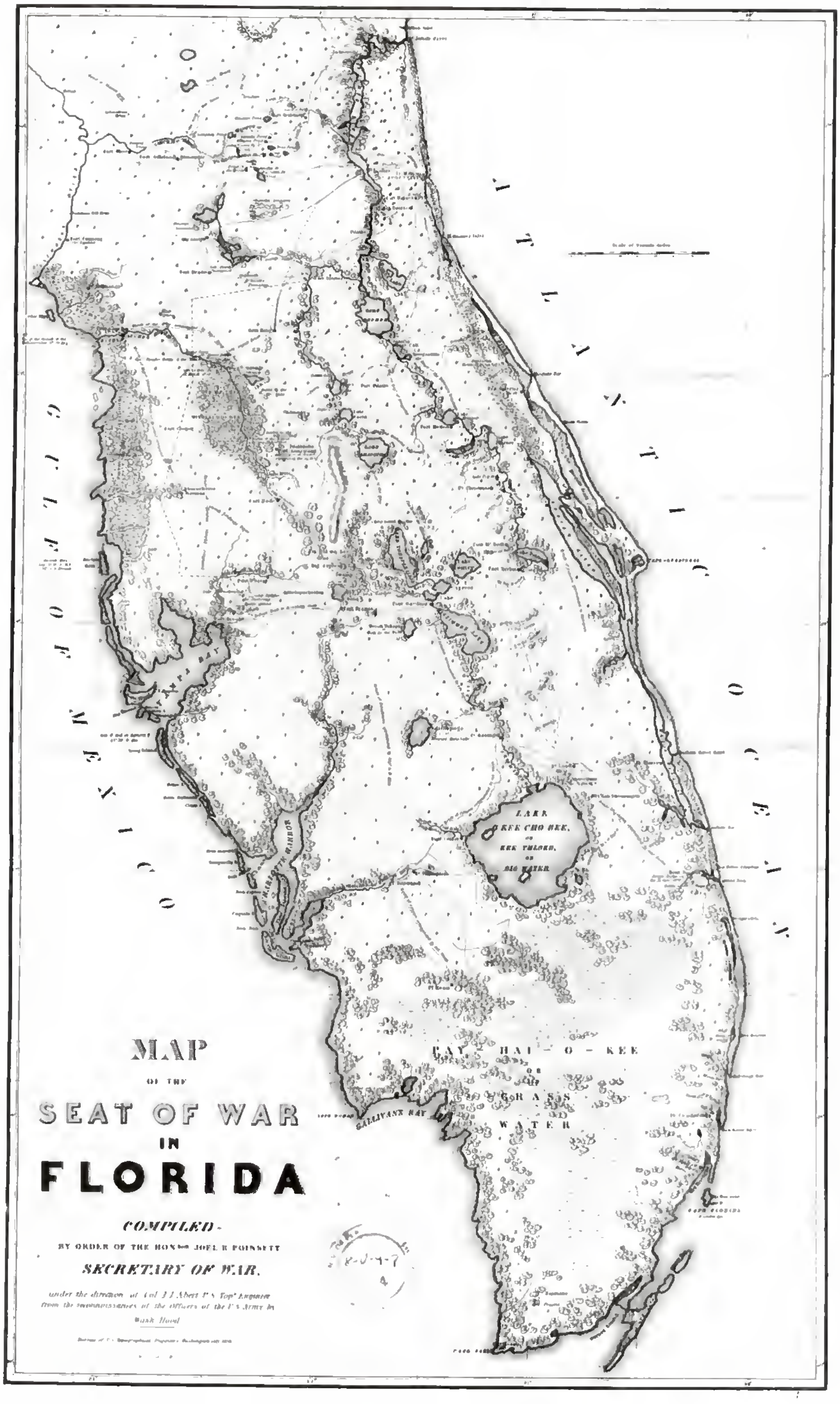

Figure 38. 1838 U.S. War Department map of Florida during the Seminole Indian War. Source: University of Florida Map Library.

> a large proportion of the area of the peninsula of Florida is practically without settlement. This appears to be due in part to the direction of the general movement of population, which has been westward from Georgia and the Carolinas; in part to the want of good harbors, and other inducements to settle upon the coast, and thus to create starting points for the settlement of the interior; but also, and very largely, to the fact that a considerable portion of the area is swampy and difficult of access, and, consequently, remote from markets (U.S. Department of the Interior 1895, p.xxix).

Indeed, the 1890 census recorded only 1,414 people in Lee County and just 861 in Dade County; more than half of these lived in small, coastal hamlets like Fort Myers and Miami (see Figure 39 for South Florida county boundaries of the time). Furthermore, although Monroe County counted 18,786 people in 1890, all but 700 of these lived on Key West (U.S. Department of the Interior 1895). Rand McNally's 1891 map of Florida corroborates the census's depiction of southern Florida (Figure 39). Relatively inaccessible wetlands covered most of South Florida's interior where nearly 400 Indians lived (Dix and MacGonigle 1905).

1895 to 1909: Dreams of Development

Few people knew much about South Florida's interior in the 1890s, but there are some sources that dealt with perceptions of the region. Travel books are one such source of information. Authors of travel books probably did not bother to visit such isolated places as the Everglades, but relied instead on hearsay and opinion to write descriptions of the region. In 1889, James Davidson published his guide for Florida tourists and settlers and included some comments on southern Florida. Of this region, he believed "there can be nothing but insects, vermin, mud, malaria, Indians, desolation, abomination, discomfort, disease, black death, and poverty--where nothing will grow but comptie and mangroves,

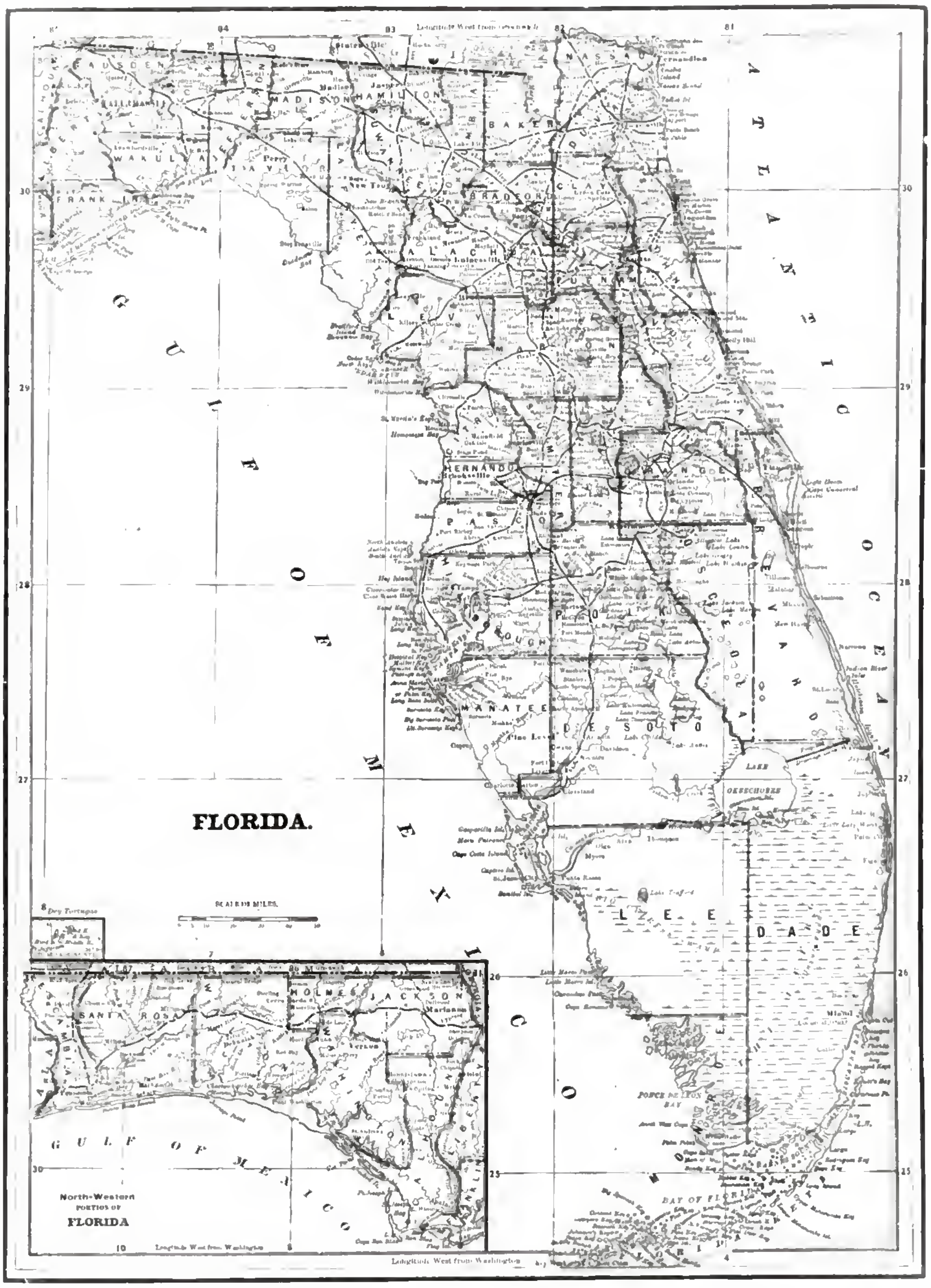

Figure 39. 1891 Rand McNally road map of Florida
Source: University of Florida Map Library.

and where nobody lives anyhow" (p.227). Davidson noted that the Glades were usually covered with drinkable water from an inch to several feet deep, and that tree islands dotted the landscape. He acknowledged Disston's efforts in South Florida, suggesting that friends of the enterprise are hopeful that the Glades could be drained, while others were less hopeful. Davidson (p.71) concluded that "it does not seem impossible that at least a part of these Everglades waters may be drained off. It seems to be a question mainly of canal capacity."

A year later, Charles Norton (1890) produced the first edition of his *Handbook of Florida.* He contended that Dade County was inaccessible to the ordinary tourist and unavailable to the average settler. Norton argued (p.19) that in addition to the remnant Seminole population, "only the most enterprising and adventurous hunters and cowboys" visited the interior. In 1895, Norton produced a third edition of his handbook. He described the Glades thus (p.270): "it is not a swamp in the ordinary meaning of the term, but rather a shallow lake with a hard rock bottom, and grass growing to a height of four or five feet above the surface of the water." Like Davidson, Norton noted the presence of tree islands and mentioned numerous canoe-width channels, but warned that it was easy to become hopelessly lost in South Florida's uncharted interior.

Marchman (1947) thought that during the early 1890s, railroad developer Henry Plant considered the possibility of extending his lines across the Everglades. To satisfy his curiosity, Plant told one of his leading lieutenants, James E. Ingraham, to organize an expedition across the Glades in early 1892. Wallace Moses (the official secretary for the 21 men) and Alonzo Church later wrote detailed accounts of their experience. In addition to their own views, both authors recorded perceptions of the Glades expressed by others.

The group began their three week long expedition from Ft. Myers in mid-March. Moses remembered that some locals thought the party would turn back shortly while others believed they would successfully cross the Glades. Church maintains that before he left, locals offered several conflicting accounts of the Everglades. One man claimed that sawgrass "extended all the way across the Glades and would be an impenetrable barrier to our advance" (Church 1949, p.19). Another informant insisted that the Glades were a "labyrinth of bayous running through a dense jungle of tropical growth" (p.19), and that they would soon become lost and starve before finding their way out. Still others were aware that Seminoles cultivated many of the more elevated tree islands. Church also remembered being told of "mosquitoes, red bugs, alligator fleas . . . and a thousand other horrors, known and unknown" (p.19). All of this frightened Church, but he remained captivated by the prospect of exploring what he and many others considered a mysterious region (p.16). The fact that the group later verified all of these stories suggests that southwest Floridians understood the Glades reasonably well.

The expedition's leader, an engineer named John Newman, encouraged his men before departure:

> should our expedition be successful it may result in good to the whole country, for if this land can be rendered fit for cultivation it will be the most productive of any in this state. . . . It would be a glorious undertaking, for charity could ask no nobler enterprise, ambition no higher glory and capital no greater increase than would result from the redemption of this land (as quoted in Church 1949, p. 20-21).

On March 22, Moses observed that the land "seems rich and would be easily cultivated once the water is permanently removed" (Moses 1947, p.14). A week later, however, Moses (p.19) conceded that "this has been a terrible strain on everybody. Locomotion is extremely slow. The bog is fearful and it sometimes seems as though it would be easier to stay in it than to go on. Both legs up to the waist in mud . . . the boats are very necessary to enable one to pull himself out of the mud, and even then the labor is most exhaustive." Church (1949 p.35) concluded that "it is enough to make a man swear to be contented ever afterwards with a board for a bed and a clean shirt once a week." Sydney Chase also made the trip and later asked Church if he wanted to invest in Everglades land, but Church had had enough: "Not on your life," he responded, "I wouldn't be caught dead with any of this property" (as quoted in Moses 1947, p.41, footnote #4). Fifteen years later, Moses had moved to West Palm Beach and thought "there is good land along the east side but doubtful if the main part of the Glades are of much value" (as quoted in Stewart 1907, p.43).

Henry Plant apparently lost whatever enthusiasm he may have had for the project, but not Henry Flagler. Flagler hired James Ingraham to help run his railroad down Florida's east coast during the 1890s. The railroad reached Flagler's intended terminus--the Palm Beaches--in early 1894. A devastating freeze in early 1895 inflicted substantial damage upon most Florida farmers, yet Miami had been spared. South Florida pioneer Julia Tuttle suggested to Flagler that he extend his line to Miami, and by April 1896, Miami had a rail connection to New York (Martin 1949). Miami's first newspaper, the *Metropolis*, raved on 26 June 1896 that the trip from South Florida to New York could be made in 44 hours. Before the railroad, it took two days to go from Miami to Lake Worth (near West Palm Beach), just 63 miles to the north. It would be several years before Everglades development, but Flagler's railroad began the process of radically transforming South Florida.

A few people engaged in premature efforts to promote Everglades reclamation. On 5 June 1896, John MacDonald commented in the *Miami Metropolis* (in a story buried on page six of an eight page newspaper) that "the improvements in machinery for draining, dredging and excavating, as well as of the steam plow, render these rich sugar lands of Florida a very safe and highly lucrative field for the investment of capital." MacDonald also noted the relationship between wetlands, mosquitoes and malaria. "And it is the universal doctrine," he assured his readers, "that countries do grow more healthful as drainage progresses, while countries requiring extensive irrigation grow more malarial."

In 1898, the Florida East Coast Drainage and Sugar Company announced plans to reclaim 800,000 acres of Everglades land. One of the company's officers, Rufus E. Rose, told the *Miami Metropolis* (21 October 1898) that draining the Glades seemed "wild and visionary." But he insisted that it "requires only a visit to similar lands in the Kissimmee Valley, formerly vast marshes, now fertile fields, to convince impartial minds of their great agricultural future." Rose had been involved in Disston's sugar plantation near St. Cloud in the 1880s. He later became Florida's State Chemist and remained a constant promoter of Everglades development. Unfortunately, Rose helped create the impression in the minds of many that freezes would not visit the Glades. "Frost to damage the most tropical fruits and tender vegetables," he insisted, "has never occurred." In any event, little became of the enterprise.

Hugh Willoughby explored the Glades in 1897, and later wrote a book about his trip (1898). He argued (p.115) that "the popular impression has always been that the Everglades is a huge swamp, full of malaria and disease germs." He insisted that "the general impression of what constitutes the Everglades is absolutely erroneous" (p.14). Willoughby noted the explosive development in and around Miami, commenting that the region's "wilderness has been rudely marred by the hand of civilization" (p.62). In the next breath, however, he asserts that it is in the nature of things that wilderness must gradually be encroached upon. In all likelihood, Willoughby found people too busy clearing land along the Atlantic Coastal Ridge to pay much attention to the Everglades. The editors of the *Miami Metropolis* published a list of "things we would like to see" in their 12 June 1896 issue. They called for bridges, sewers, new houses, and other infrastructure--but absent from this list was any mention of Everglades drainage. Turn-of-the-century South Floridians may have avoided the Everglades because they feared malaria but, more likely, they were busy with plenty of other profitable opportunities along the more elevated ridge.

While sailing from Miami to the southwest Florida coast, Willoughby noticed several off-shore springs which he correctly believed originated in the Everglades. While plodding through the water-covered Glades, he noticed springs everywhere. "All this moving water cannot be accounted for by the rain alone," he thought, "and the water is too hard for rain water, so in all probability more comes from below than above" (p.119-20). Willoughby had no idea that he was traversing one of the most productive aquifers in the world. It is hard to gauge how much Willoughby's writing influenced others, but several authors of travel books repeated the misconception that much of the water in the Glades came from distant groundwater sources rather than precipitation in South Florida.

Jacksonville's *Times-Union* expressed approval of wetland drainage in the Glades and elsewhere in Florida. "Besides the millions of acres that will be reclaimed in south

Florida," the editor argued on 5 October 1898 (p.4), "there are thousands of others only second in productiveness, and these will be reclaimed from Pensacola to Miami." Hinting that some people did not agree, the editor concluded that "the immediate future will prove an era of phenomenal development for this State, and this men may retard but cannot stop even when they are so unpatriotic as to use power or influence to that purpose."

I.L Roberts also supported Everglades reclamation. He claimed on page five of the *Miami Metropolis* for 14 April 1899 that he had made an effort to attract businessmen to the Glades in 1876, "and has ever since stood astounded at the negligence and disinterestedness of capital on this subject." To him, it seemed incomprehensible. As far as Roberts was concerned, "it seems as if nature has placed this wonderful cornucopia at our hands and merely asks us to empty it at our pleasure" (p.5).

Many people in 1900 viewed practically all "unused" land as waste--this included the Everglades. To make land yield tangible benefits was a laudable goal. Jacksonville's *Times-Union* (25 October 1899 p.4) appeared to agree when it argued that Everglades reclamation would "make us independent of the sugar tribute now demanded, and change the unfortunates of our slums into self-respecting self-governing American farmers." Of course, a handful of optimists do not represent popular opinion. The editor of the *Miami Metropolis* probably came closest to most people's view of the Glades in the late 19th century when he suggested that visitors to Miami should "not fail to take a trip up the {Miami} river to the rapids and look upon that vast mysterious waste known as the Everglades" (30 October 1896 p.3).

Prior to 1900, the federal government had very little to do with wetland reclamation. As part of the Rivers and Harbors act of 1899, however, Congress authorized a survey of the Kissimmee and Caloosahatchee Rivers with a view to improving navigation (Figure 5). During the dry season, these rivers became so low that they hindered navigation, a vital concern for people who lived where there were no roads. Disston dug several canals connecting many lakes in Florida's heartland with the Kissimmee River which empties into the north shore of Lake Okeechobee. He also helped connect Lake Okeechobee to the Caloosahatchee River. W.H. Caldwell conducted a preliminary survey of the region in 1899 for the U.S. Army Corps of Engineers (U.S. House of Representatives 1902). Caldwell found many settlers along the Kissimmee River all the way down to Fort Bassinger (Figure 3). Yet the last 20 to 25 miles of the river were uninhabited and "bordered by an impenetrable marsh, which extends back from the river for many miles on either side" (U.S. House 1902, p.9). Caldwell added that "Lake Okeechobee's borders are similar to the lower end of the Kissimmee River" (p.9). He found the lakeshore almost deserted except for a few orange groves on the north shore near Taylor Creek, the beginnings of a town eventually named Okeechobee (Figures 3 and 5). As for the Caloosahatchee River valley, Caldwell found fruit and vegetable farms from Ft. Myers inland to Ft. Thompson (Figure 3). Yet he found almost nobody living between Ft. Thompson and the big lake.

As a result of this reconnaissance, Caldwell argued against improving the entire waterway from Kissimmee to Ft. Myers. He suggested improving the waterway between Kissimmee and Ft. Bassinger, and from Ft. Thompson to Ft. Myers (Figure 3). The intervening area was virtually uninhabited and Caldwell concluded that it had no immediate future. Furthermore, farmers and ranchers along the inhabited stretches of the two rivers spoke out against improving the entire route. Kissimmee River people feared that improving the lower portion of their river might permanently lower water levels throughout the river. Caloosahatchee River residents resurrected charges that improving the upper section of their river would allow excess water from the big lake to flood them out. Finally, Caldwell contended (U.S. House 1902, p.14) that “the only interests demanding a through route from the Caloosahatchee to the Kissimmee are tourists, but such travel is too insignificant to be worthy of consideration.” Again, it appears that central and south Floridians rejected moves that would lead to Everglades development, not because they disapproved of such development--but because they were trying to develop their own property elsewhere.

The pace of change in South Florida continued to accelerate after 1900. People poured into the region and some of these spilled into the Everglades. For one thing, fishermen began to settle the shores of Lake Okeechobee. Commercial fishermen took tremendous numbers of catfish from the big lake (Hanna and Hanna 1948; Will 1965a). Hunters also settled the shores of Lake Okeechobee at the turn of the century. One of the region’s early settlers, Lawrence Will, wrote that hunting brought in badly needed cash (Lawrence E. Will, personal and public papers). It is easy to imagine turn-of-the-century hunters plying the Glades all year in search of alligators. Yet Will contends that alligators “were so abundant that their hides were worth mighty little, only 10 cents per foot from 1900 until 1915 or later” (Lawrence E. Will, personal and public papers). Wildcats and panthers were plentiful as well, and their skins failed to command much money for the same reason. Hunters pursued higher-priced otter and racoon skins during the winter months, and plumage-producing birds during the spring--for they brought the real money.

Plumes were in demand because they commonly adorned women's hats during the late 19th and early 20th centuries. Florida passed bird protection laws in 1877, 1879, and 1891, but these proved utterly ineffective (Hanna and Hanna 1948). In 1900, the federal government passed the Lacey Act which prohibited interstate commerce in birds protected by state law. The National Audubon Society provided wardens for South Florida, the most famous of which was Guy Bradley, who was shot to death in 1905 after confronting plume hunters (McIver 1989). The Hanna's (1948 p.341) painted this graphic picture of plume hunting.

> To get the most beautiful plumes, birds had to be shot while on their nests. After they dropped, the plumes were torn off and the bird cast aside. Back in the nest the young weakened and starved to death or fell from the nest through sheer inability to stand up and were drowned. Nesting areas frequently included hundreds of birds. When such a colony was shot up nothing was left but a scene of desolation with dead birds strewed about, feathers scattered among the starving young, while vultures wheeled in for a square meal.

When Julian and A.W. Dimock complained to an old "Florida Cracker" (usually defined as any rural, native, Floridian) about the slaughter of birds, they received the following response: "every egret and long white that's shot in this country is killed on an order from New York. Your rich merchants send agents down here to hire hunters and Indians to get plumes for them" (Dimock and Dimock 1908, p.300). The Dimock's informant added most plume hunters struggled to survive, while northern tourists "bring with them an automatic shotgun and a repeating rifle and bang at everything that flies or crawls" (p.300).

At the turn of the century, long-standing attitudes toward natural resource exploitation came under increasing attack by both preservationists and conservationists.

Preservationists, a relatively small but vocal minority, placed much more emphasis on recreation and aesthetics. On the other hand, Samuel Hays (1959 p.127) maintained that conservationists were "the apostles of the gospel of efficiency {and they} subordinated the aesthetic to the utilitarian." Everglades drainage became part of a national movement in the early 20th century to eliminate natural resource waste. F.A. Hendry argued the case for "conservation" in South Florida: "Old Dame Nature has been fixing up this trick for ages. She never does it all, but always leaves something for man to do. It is here she temptingly invites man to roll up his sleeves and pitch in" (*Ft. Myers Press* 12 Oct 1906 p.7).

In 1902, Congress passed the Newlands Reclamation Act, which funded irrigation projects designed to make arid lands throughout the West agriculturally productive (Rowley 1996). That same year, Congress created a Bureau of Drainage Investigations within the U.S. Department of Agriculture's Office of Experiment Stations. Furthermore, drainage organizations lobbied for a national drainage service to help reclaim wetlands, and Congressman Halvor Steenerson (from Minnesota) introduced such legislation in 1906. The *Pensacola Journal* (1 April 1906 p.10) supported the bill: "it means that tens of millions of acres of the most fertile lands imaginable, which has lain idle for ages, may be converted from dismal and pestilential swamps and useless bogs into highly prosperous homes, to become the garden spots of the nation." The hoped for drainage service never materialized, but agitation to "make better use" of wetlands continued.

The year 1900 marked the election of William Sherman Jennings as Florida's governor, and he took a lively interest in the Everglades. Even the new governor's wife, May Mann Jennings, became interested in the Glades. Mrs. Jennings's biographer notes that "her natural affinity for nature and for tropical Florida turned May's interest in the Everglades into a lifelong commitment" (Vance 1985).

Well aware that the state legislature had granted to corporations more land than the state owned, Governor Jennings discovered that the federal government had never formally transmitted to Florida the swamp and overflowed lands in the southern section of the state. On behalf of the state in 1903, he applied for and received such lands while ignoring previous legislative grants. In his 1903 message to the state legislature, Jennings insisted that the Glades could and should be drained. He leaned heavily upon an 1886 report by Disston's chief engineer, James Kreamer, who maintained that the Glades could be drained by digging several canals through the Atlantic Coastal Ridge. Jennings concluded that "observant stockmen, and other Floridians familiar with the Everglades, all concur in saying that the reclamation of this vast area is entirely feasible and that the cost would, in comparison with the value of the redeemed territory, be a mere bagatelle" (U.S. Senate 1911, p.88).

The Swamp Lands Act of 1850 stipulated that proceeds from the sale of such lands would be used to fund drainage operations. Because these lands remained flooded, however, they attracted few buyers; because there were few buyers, there was little income for drainage. Moreover, corporate interests engaged in a legal battle to gain title to South Florida swamp land. According to Hanna and Hanna (1948 p.121), Jennings worried that an "absence of a policy by the administration was already being pointed by the railroads, and the governor's legal position would be weakened if a policy did not materialize." Yet the Federal government never once protested to Florida concerning the disposition of wetlands granted under the Swamp Land Act.

In 1904, Charles G. Elliott, a drainage engineer with the U.S. Department of Agriculture, made a preliminary investigation of the Glades in an effort to determine the feasibility of draining a small tract for experimental use (U.S. Senate 1911). He noted that the Florida East Coast Railroad had already spent a great deal of money trying to clear and enlarge existing rivers along the lower east coast. Their operations were intended to enhance winter fruit and vegetable production by reducing flooding along arms of the Glades that extended across the ridge toward the coast. Elliott observed that no Glade land had been adequately drained to produce crops during the entire year. He recommended gradual development of the Everglades as demand for produce increased, using dikes to protect individual farms. This suggestion met with little favor among those who had high hopes for Everglades development, but Elliott's report attracted little attention because relatively few people cared about the Glades.

Only with Napoleon B. Broward's decision to run for governor of Florida did the Everglades attract much attention. It was Broward, more than anyone else, who forced Everglades drainage upon the public. Broward canvassed the state in 1904, promising (among other things) to drain the Glades. Brooks (1988) contends that Broward adopted the Everglades issue as a desperate attempt to put some political distance between himself and other candidates. Yet as Brooks suggests (p.42), "in allowing the land question to begin to dominate his speaking, Broward was faced with all the rhetorical liabilities surrounding the issue." Interestingly, Broward lost Lee and Dade Counties during both

Democratic primary elections in 1904 (Figure 39). The electorate consisted largely (if not entirely) of white males, but Broward's failure in these counties suggests that many of these voters were uncertain or even apathetic regarding Everglades drainage. Moreover, there are those who favored Broward but not Everglades drainage. For example, H.F. Urie later wrote the *Fort Myers Press* (2 Nov 1906 p.3): "I voted for Governor Broward in both primaries, but not on account of his drainage scheme, as that, to my mind, is anything but a wise or practical operation."

Soon after his inauguration in 1905, Broward called for legislation creating a drainage district for much of South Florida. This district would have the power to levy taxes, but the court soon declared the legislation unconstitutional. Broward went to South Florida to make his own inspection of the Glades. Acting as his own engineer, he devised a plan for draining the Glades and used the few remaining dollars in Florida's Internal Improvement Fund to obtain a couple of dredges to begin digging canals from the southeast coast to Lake Okeechobee in July 1906. Broward spent a tremendous amount of energy supervising and attending to drainage details (Knetsch 1991). He later wrote C. Horace McCall (as quoted in Proctor 1950, p.260), explaining his enthusiasm for Everglades development by casting it in terms of development across the Unites States: "this land would have remained a wilderness and would have been inhabited by the Indians until the dawn of the millennium had those who preceded us been as weak as the majority of those who quibble now, and stand on the bank and shiver and shake, instead of plunging in and doing something."

In 1906, the governor backed a constitutional amendment which would overcome some of the court's objections. Broward engaged in yet another public relations campaign on behalf of his Everglades drainage project. As part of this campaign Broward made speeches around the state; he even prepared an open letter to the people of Florida. He insisted that "it would indeed be a sad commentary on the intelligence and energy of the people of Florida to confess that so simple an engineering feat as the drainage of a body of land twenty-one feet above the level of the sea was beyond their power" (Broward 1906 p.1). Broward sincerely believed that draining the Glades was a simple matter, and that the total cost would not be more than a dollar per acre. Confident of his plan, Broward claimed "I can do the whole business in five years at the outside and turn the everglade swamps into an earthly paradise. . . . The main canals would lower the level of the lake so that settlers could move in even before the lateral canals were completed" (*Pensacola Journal* 6 Nov 1906 p.2). When somebody suggested that South Florida's peat soil would burn after drainage, Broward retorted that "if such a thing as a large area of land catching fire and burning up as the opponents claim had been possible, the great bogs of Ireland would have been ash heaps long before St. Patrick drove out the snakes" (*Times-Union* 1 Nov 1906 p.2). Asserting that Lake Okeechobee was 21 feet above sea level and that water ran downhill, he branded those who maintained that the Glades could not be drained as tools of corporate interests.

Florida's newspapers recorded much of the discussion regarding Everglades drainage in 1906. Some writers questioned the feasibility of Broward's plan; others questioned its desirability; still others favored drainage but not Broward's plan. Finally, many people confessed that they simply did not know much about the Glades. For instance, the *Ocala Banner* (27 April 1906 p.1) cautioned that "care should be taken to distinguish between the naked proposition that the Everglades can be drained . . . and the method adopted by the board to accomplish this gigantic enterprise." Kissimmee resident C. Mailing went even further, simply ridiculing Broward's plan. "The profile drawings attached to the governor's appeal must have been made in a kindergarten. They are absolutely valueless. . . . To show one body of water {Lake Okeechobee} higher than another on a plain and then draw a straight line from the highest to the lowest point and call that an engineering drawing is something very novel" (as quoted in the *Times-Union* 1 Nov 1906 p.2).

Jacksonville's *Times-Union* assailed practically everything Governor Broward called for, including Everglades drainage. On 3 March 1906, the *Times-Union* pointed out that only one million of Florida's 37 million acres of land were in cultivation. The paper suggested that the state would be better off devoting its energy to attracting immigrants from other states to farm these uplands. "It is not yet certain that the Everglades can be drained," the *Times-Union* editor maintained. "It is not yet certain that they are worth draining" (3 March 1906 p.6).

On 17 August 1906, the *Times-Union* insisted that draining the Glades (or any other wetlands) would cost far more than Broward's suggested average of one dollar per acre. The editor contended that no one can know how much it will cost to drain the Everglades until they are surveyed--and the state had no plans for a survey. Making the case as plain as possible, the newspaper drew this analogy: "now if a stranger should come along and give you this advice--to drain land you didn't need, to commence digging without knowing how much it would cost, without knowing if you could drain it or whether it would be worth anything if drained . . . you would leave and not be slow about it" (p.4).

Up to this time, the *Miami Metropolis* remained relatively quiet on the drainage question and on Broward's proposed constitutional amendment creating a drainage district for the Everglades. On 20 April 1906, however, one South Florida farmer wrote the *Metropolis*, complaining that he was tired of being flooded out. He favored draining the Glades, admitting that some say it is not possible. If it is not possible, he asked, why were the railroads still interested in the land? He viewed corporation interest as a sign that the Glades could, in fact, be drained. On the other hand, a central Florida citrus farmer expressed local concerns in a letter to the U.S. Department of Agriculture. His farmer friends thought that large and deep canals in South Florida "might lower the groundwater level of practically all of the state that is adapted to citrus fruits and consequently injure {our} groves by robbing then of their supply of moisture" (as quoted in the *Miami Metropolis* 23 March 1906 p.8).

On 7 September 1906 (p.3), the *Miami Metropolis* ran statements from several of Florida's newspapers regarding the Glades. For example, the *Pensacola Journal* commented on the Everglades debate between Broward and Pensacola's State Senator John S. Beard. Beard argued that the court still had not decided whether or not the state owned the Glades. Therefore, it would be foolish to begin draining the Glades if the court later determined that corporations were entitled to the land. The *Journal* insisted that "we do not say that this point alone should determine the whole question of supporting or opposing the drainage amendment, but we do say that it is a question that will cut a large figure in the case and ought to be answered."

The *Punta Gorda Herald* summarized what was probably true for many people of the time: "the reason that the *Herald* has had nothing to say on the much discussed problem of drainage of the Everglades is simply and candidly that the Herald knows nothing about it. . . . The *Herald* is utterly obfuscated." Continuing, the *Herald* summarized the debate: "on one side is arrayed the Governor of the State, a number of respectable and honest newspapers and many reputable, upright and intelligent citizens. . . . On the other side, however, there are a number of capable and honorable newspapers and a good many patriotic, able and conscientious citizens who contend that the drainage of the Everglades is impractical, wholly unnecessary and not worth the cost."

The *Tampa Times* remarked that the coming election on the drainage district constitutional amendment "will not reflect any discriminating knowledge of the subject on the part of the voters, for 95 percent of us don't know enough about the subject to warrant us in voting one way or the other." The *St. Augustine Record* agreed and advocated caution: "A majority of the newspapers of Florida come frankly with the statement that they are unable to get their bearings on the Everglades drainage discussion and the constitutional amendment. That being the case, would it not be very unwise to vote for something admitted to be an uncertainty?"

A week after votes were cast on the drainage amendment, the *Times-Union* reported complete returns for 20 counties, partial returns from 20 others, and nothing from six Panhandle counties (11 November 1906 p.1). In addition to being incomplete, these returns generally reflect the opinion of the relatively few white males who voted. Furthermore, a person's vote on the amendment was not necessarily a reflection of one's attitude toward drainage or the Everglades. Nevertheless, these returns do reveal much ambivalence regarding drainage in South Florida.

Overall, 6,007 voters favored the drainage amendment and 10,725 were opposed. Just nine counties reported a majority in favor of the amendment, eight of which lie north of Orlando (Figure 3). Lee County stood alone among central and southern Florida counties favoring the amendment, with a lopsided tally of 419 in favor and 14 against. This may reflect the strong support of the *Fort Myers Press* which lobbied in favor on the amendment (19 Oct 1906 p.2 and 1 November 1906 p.4). It may also reflect the view of Caloosahatchee River valley farmers as indicated by these comments found in the *Fort Myers Press* 28 Sept. 1906 p.2: "the settlers say as a rule they went there almost penniless and have managed by hard labor to bring their groves into bearing which now promise them handsome incomes but are liable to be destroyed at any time by overflow and they appeal to the voters of the state to protect them from this threatening disaster." Yet Monroe County voted solidly against the amendment (76 in favor, 254 against), as did Dade County (350 for, 487 against). Perhaps this reflected, in part, Monroe County's relatively small stake in the Glades (Figure 1). It may also have reflected the thinly-veiled hostility of the *Miami Metropolis* in addition to what Marjory Stoneman Douglas (1987) contends was the violent opposition of her father's newspaper, the *Miami News-Record* (later the *Miami Herald*).

In any event, after having similar legislation declared unconstitutional in 1905, Florida's legislature created the Everglades Drainage District in 1907--a poorly conceived entity which managed to avoid constitutional scruples. 1907 also marked the appearance of a USDA report entitled *Swamp and Overflowed Lands in the United States.* According to the author of the report, James O. Wright, practically all of the desirable farmland was occupied and that it was necessary to drain wetlands and put them to productive use. "Not all swamp land is suited for agriculture," Wright contended, "but from the data collected and analyzed by this Office it is certain that there are in the eastern portion of the United States 77,000,000 acres that can be reclaimed and made fit for cultivation by the building of simple engineering structures" (Wright 1907, p.8). He asserted that there was no question as to the fertility of swamp and overflowed land. Wright acknowledged that in some instances, much time and money had been wasted because of insufficient planning or legislation. Maintaining a view of conservation typical of his generation, he believed that all natural resources were to be used for the betterment of the nation. Wright "hoped that the American people will soon take steps to abate this nuisance and make these lands contribute to the support and upbuilding of the nation" (p.23).

James Wright also played a significant role in early efforts to drain the Everglades. In July 1906, Governor Broward began drainage operations in South Florida. When Broward requested assistance from the USDA, Wright was instructed to investigate the Glades. His mission was to ascertain the suitability of soils for agriculture; to determine if the Glades could be drained and if possible, to prepare a drainage plan; and to estimate the cost of such a project. Wright found the data Broward used and placed surveyors in the Everglades during the winters of 1906-7 and 1907-8.

Wright's leader of Everglades field work during the first winter, John T. Stewart, prepared a report of his investigations shortly after his return to Washington in May 1907. Referring to the Big Cypress Swamp and land immediately north, Wright's subordinate insisted that "there can be no drainage of any large section in this area without affecting that of another as the divides are only noticeable during low water" (Stewart 1907, p.88). Stewart noted that they needed to do much more work in order to determine the best routes for canals, estimates of their cost, and value of land once drained. "There is some doubt in my mind about the value of the Everglades proper for agricultural purposes if drained," Stewart concluded, "but the country lying east and west of the Glades are the lands which need immediate attention and will be greatly benefited by the lowering of Lake Okeechobee" (p.88).

Stewart advocated interviewing older residents regarding their views on draining the Glades as a way of gaining their confidence and learning how to satisfactorily answer any objections. In fact, he spoke with many South Floridians before he wrote his own report. Stewart observed that "many in the vicinity of Miami do not want the Glades drained" (p.54). He noted that George Butler, a surveyor and tax collector in Miami, thought that "there is land enough without the Glades;" Butler prophetically added that "they would not be a desirable place to live on account of the distance from markets and poor roads." Several people expressed their fear of overproduction if the Glades were drained for agriculture, and others told Stewart that the Glades warmed the cold northwesterly winds during the winter. "What they want," Stewart concluded, "is enough drainage to prevent flooding {of the Atlantic Coastal Ridge} in the rainy season" (p.54).

As seen earlier, however, residents of the Caloosahatchee River valley favored Everglades drainage largely because they thought controlling Lake Okeechobee would prevent flooding along the river. Yet not everybody in Lee County favored drainage. Former Indian agent and Ft. Myers resident J.E. Brecht argued that "climate is really the only thing of which this country can boast" (as quoted in Stewart 1907, p.41). Lee County Superintendent of Schools J.F. Shands agreed with Brecht that only the lands immediately south of Lake Okeechobee would be worth draining (Stewart 1907, p.36). Finally, Ft. Myers resident and timber estimator W.A. Roberts shared a belief held by many people on both east and west coasts that soils of the southern Glades were too thin and rocky to be worth reclaiming (Stewart 1907, p.39).

On 28 February 1908, the front page of the *Miami Metropolis* blared: "It is not a difficult task to drain the Everglades, said U.S. Government expert Wright, in an able discussion last night." Apparently Wright could not resist the temptation to address the region's potential--even before he had finished collecting data necessary for his forthcoming report. By this time, the *Miami Metropolis* had swung solidly in favor of draining the Glades. Despite the fact that no one had ever tried to drain such a large wetland as the Glades, the *Metropolis* assured its readers that "he {Wright} has done enough work of this kind to show that there are no engineering difficulties to overcome in the draining of the Everglades" (p.1). Wright unwisely led people to believe that the project was simple and the soil would be extremely productive when drained. Almost parenthetically, the *Metropolis* added that Wright's opinion of the Glades is at least partially based on drainage projects he had been associated with in Louisiana: "and he sees no reason why results should be different here" (p.1).

Turn-of-the-century non-fiction writers usually expressed a combination of attitudes toward the Glades. Some appreciated the region's beauty and mystery. Writing for *Century Magazine*, Dix and MacGonigle (1905 p.526) contend that "no description of the physical features of the Everglades can possibly convey any true idea of their beauty and their charm. . . . Both charm and beauty blend in a strange, sweet sense of mystery, which even one least responsive to this new mood of nature cannot possibly escape." As drainage became imminent, however, writers like the A.W Dimock (1907) took a different approach. After crossing the Glades, he remarked that his experience was that "one meets delay in the Everglades, but not danger. . . . Crossing the Everglades of Florida in a canoe is not an adventure, it is a picnic" (p.220).

A utilitarian tone creeps in A.W and Julian Dimock's (1908 p.264) discussion of the Glades and drainage: "the demand for the work is so universal, its benefits so obvious and the engineering difficulties so inconsiderable, that the time cannot be far distant when the South Floridian will fear the floods that afflict him to-day no more than the Dutchman dreads the Zuyder Zee." Dupuy (1908) detailed hardships suffered by the federal government's engineers as they collected data while crossing the Glades during the winter of 1907-8. He maintained that draining the Everglades would be a simple matter. "There is no difference of opinion on the part of the engineers who have investigated the conditions," he contended, adding that "their recommendations are unanimously in favor of pushing the work" (p.9897).

In the mean time, Broward's inadequate dredges slowly cut through the rock near the headwaters of Ft. Lauderdale's New River into the Glades. In 1907, after nine months of dredging, the engineer in charge reported one canal a little over a mile long (U.S. Senate 1911, p.110). Yet when a committee of state legislators visited South Florida that year, they "could clearly see that the effect of the canal has been to drain the land for, say, one-half mile or more on either side of the canal and for a considerable distance in front of it" (U.S. Senate 1911, p.111). They estimated that 750 acres had been reclaimed. What the committee did not see--what they could not see--was that water levels more than a half mile from the canal were probably unchanged. Similarly, land promoters later hauled countless investors up and down South Florida's canals in an effort to convince prospective buyers that the Glades were being drained.

At the end of 1908, as Governor Broward's term drew to a close, two dredges had cut canals a little over six miles each from both North and South forks of Ft. Lauderdale's New River into the Glades. Lack of dredging progress may be attributed to two causes. First, since large landowners refused to pay Everglades Drainage District taxes, and since few farmers were willing to purchase swamp land from the state--the trustees of Florida's Internal Improvement Fund had little cash with which to pursue drainage operations. Second, dredging was necessarily slow because most of the digging thus far had been through limestone rock underlying the Atlantic Coastal Ridge rather than the relatively soft muck of the Glades proper (Knetsch 1991; Figure 40). As 1908 drew to a close, Broward made one last desperate attempt to push the work--he persuaded R.J. Bolles to buy 500,000 acres of Everglades land for one million dollars. This not only provided much needed revenue for the project, but also paved the way for radical efforts to change people's perception of the Everglades.

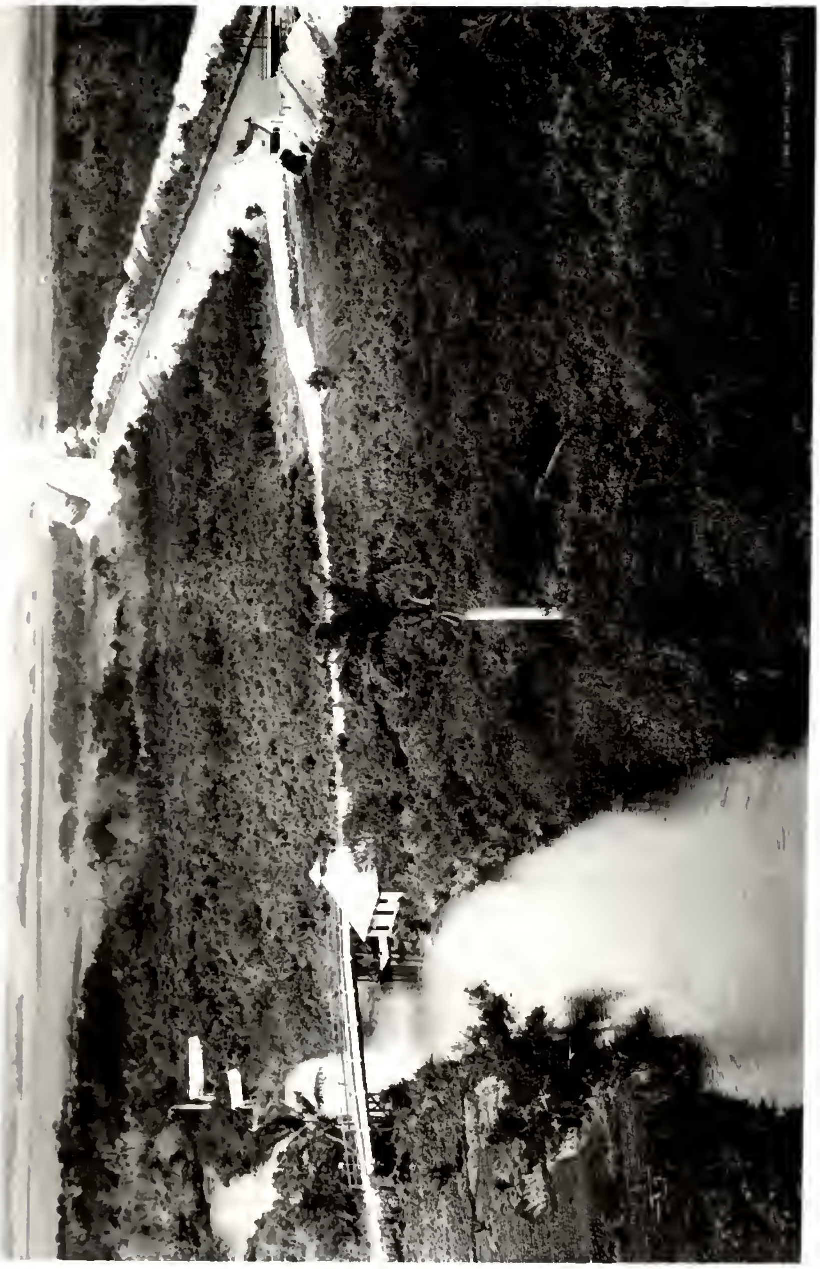

Figure 40. Photograph of the Miami River (left) and the Miami Canal (right), January 1912.
Source: Florida State Archives.

1909 to 1912: Everglades Fever

In a 21 October 1909 letter to the Everglade Land Sales Company, the editor of the *Miami Metropolis* contended that opposition to draining the Everglades was rapidly disappearing (Thomas E. Will, Personal and Public Papers). Although there would continue to be those who expressed doubts about the Glades, 1909 marked the beginning of what one might call "Everglades fever." Large landowners in the Glades bombarded the American public with a promotional blitz that would bring smiles to the faces on Madison Avenue today. It was during this period, 1909 to 1912, that the Everglades took on a new identity: instead of being a watery waste that Governor Broward futiley tried to reclaim, the Glades began to be perceived as a land of immense potential. This section summarizes documentary materials from that time period in an effort to recreate people's image of the Everglades immediately prior to initial settlement.

One of South Florida's early boosters, John C. Gifford, published an article about the Everglades in a 1909 issue of *Conservation Magazine*. He contended that "the drainage of the Everglades is now well under way, and almost every unprejudiced person who visits this work becomes an enthusiastic convert" (as quoted in Gifford 1912, p.1). Indeed, the *Miami Metropolis* asked prominent Philadelphia businessman Harold E. Gillingham what he thought of the Glades after visiting the region in early 1909. Gillingham responded that "my surprise was past description when I saw the wonderful work accomplished in so short a time" (*Miami Metropolis* 10 April 1909, p.6). What is interesting to note, however, is Gillingham's assessment of northern people's view of the Glades up to that time. "When the average person from the north makes his first trip to southern Florida," Gillingham began, "he comes with the idea that the Everglades are an enormous expanse of tangled overgrowth of tropical vegetation almost impenetrable and with from two to ten feet of water over all a veritable swamp. Imagine the surprise when one first sees the Everglades, so similar to a western prairie, with only a few inches of water" (p.6). One can readily imagine Gillingham's surprise if he had taken the time to re-visit the Glades at the end of the wet season!

Also appearing in the 10 April 1909 issue of the *Miami Metropolis* were the comments of Reverend J.F. Poterfield, a Baptist minister from Iowa. "Before we visited these Everglades, we were told 'It's a great big swamp;' 'a canebrake marsh;' 'a stagnant, mosquito, malaria-breeding hole;' an alligator pond'" (p.6). Poterfield concluded after his tour that all of these descriptions are "as far from the truth as daylight is from darkness" (p.6). He went on to rave about the region's potential for development.

In early 1909, as Richard J. Bolles marshaled his resources in an effort to sell his half a million acres of Everglades, Florida's Department of Agriculture produced a pamphlet on the Glades as a way of answering the voluminous requests for information. This 13-page document (dated 1909) is a compilation of some of the most complimentary statements ever made about the Everglades. After quotations from several observers, an invitation to visit the Glades was extended to those interested: "such inspection will convince any reasonable person of the feasibility of the plan for drainage" (p.12). On the very last page comes the only word of warning. The State's objective was to cut a handful of main canals in order to control Lake Okeechobee and excess rainfall in the Glades--individual property owners would have to dig additional ditches in order to thoroughly drain their property.

Also in 1909, Miami resident Rodmond Smith investigated the drainage proposition and wrote his own synopsis of the scheme. Smith claimed that he did not own a single foot of Everglades land, but that he wanted to examine all of the old reports and written observations of the Glades in order to determine for himself if the scheme was worth while:

> I have often been surprised, at the number of its {Miami's} citizens who are skeptical as to the feasibility of the drainage of the Everglades, and as to its desirability if it could be shown to be practicable. Nor is this sentiment confined alone to ignorant or illiterate persons, for I have found it entertained by many intelligent and well informed persons at home, and elsewhere (Smith 1909, p.1).

Smith believed it would take relatively little effort to make the Everglades soil productive. He understood the seasonal variation in precipitation but ignored the impact of annual variation, especially that which could be caused by tropical storms. He dismissed as "baseless" any suggestion that the soil might burn if drained; fires could easily be extinguished. Like many other conservationists of his day, Smith placed great faith in scientists. He ignored contentions that drainage might produce lower winter temperatures because professional experts who have given the subject much consideration dismissed such claims (p.23); and Smith confidently asserted that "the whole matter of drainage and irrigation will be under the complete control of the engineers in charge" (p.24). Regarding the potential for freezing weather, Smith argued that the instances of frost over the previous 15 years "could be counted on one hand" (p.27). Never mind that this fact suggested the potential for damaging frosts in the Everglades. Smith did have one disagreement with drainage proponents: he doubted claims that all three to four million acres in South Florida could be drained for one dollar per acre, maintaining that the project would cost $1.68 per acre!

Smith relied upon several sources of information in putting together his booklet, one of which he claims is the "Wright report of 1909." It will be recalled that in 1906, the USDA authorized one of its drainage engineers, James O. Wright, to conduct an investigation of the Glades and to prepare a plan of drainage if practicable. After surveyors finished their second of two winters surveying and compiling notes on the Glades, Wright began to prepare a report in May 1908. In early 1909, a Colorado developer named Henry Hall asked Wright and his Drainage Investigations supervisor (Charles G. Elliott) for a copy of Wright's forthcoming report. Elliott refused Hall's request because the report had not yet been approved, let alone published (U.S. House of Representatives 1912, p.788). Wright later recalled that Hall produced a letter from the USDA's Secretary James Wilson authorizing an abstract of the Wright report to be sent to Hall (Wright 1911 p.6). Secretary Wilson denied making such authorization (U.S. House 1912, p.1298). Nevertheless, soon after Hall received an abstract of Wright's forthcoming report, Wright convinced Elliott that it was only fair to give the same information to the trustees of Florida's Internal Improvement Fund (Wright 1911). Florida's Governor Albert W. Gilchrist then asked Secretary Wilson for authorization to share the abstract with the State legislature. When Governor Gilchrist received Secretary Wilson's 27 March 1909 letter granting permission to share Wright's abstract with Florida's legislature, the State published several thousand copies for general distribution, a move that Secretary Wilson later claimed he never intended (U.S. House 1912, p.1299). In any event, this is almost certainly the "Wright Report" that Rodmond Smith claims he read while preparing his own booklet.

Publication of the Wright abstract (Wright 1909), which contained the engineering features of the full report, served to fan the flames of land speculation in South Florida. Some people still questioned the desirability and feasibility of Broward's plan for the Everglades. But land promoters quickly pointed out that Wright was an engineer employed by the federal government; and they engaged in a desperate attempt to give the project credibility by making it appear as if Everglades drainage had the backing of the federal government. Like other engineers before him, Wright believed that the Glades could be drained and made productive with comparatively little effort. In his 19-page abstract of the full report, Wright claimed control of Lake Okeechobee was critical but that a dike surrounding the lake would be too expensive. He suggested digging several canals across the state. What data did Wright use to determine how large the proposed canals should be? In his abstract (p.13) he argued that "there is no authentic record of the rainfall in this area except at Kissimmee in the northern portion, so we must assume that the rainfall at this station represents fairly accurately that of the entire watershed." Wright estimated Kissimmee's average annual precipitation from 1898 to 1906 at 53 inches, with a range of 40.22 and 70.92 inches.

He recognized the seasonal nature of South Florida's rainfall, but ignored the region's potential for excessive precipitation. After noting Kissimmee's July and August 1905 two month total of 27.95 inches, he pointed to July and August 1905 combined totals at Jupiter (20 inches), Ft. Myers (24 inches), and Miami (25 inches). "This would seem to indicate," Wright asserted (p.13), "that the rainfall at Kissimmee was increased by some local influence that did not exist throughout the peninsula, and that probably the rainfall over the entire drainage area did not exceed 26 inches." Wright then drew a remarkable conclusion (p.13): "as a fall of 26 inches in any other two consecutive months is the closest approach to this amount, it is safe to conclude that 26 inches is an extraordinary rainfall, not likely to occur except at rare intervals, and it would be hardly wise to or prudent to base the carrying capacity of the drains on this amount." He then argued that it would be sufficient to dig canals capable of removing 24 inches of rainfall during a two month period.

Wright's abstract does not include any precipitation tables, so it is difficult to determine the size of his data set. Although he referred to stations in Kissimmee, Jupiter, Miami, and Ft. Myers, and he drew his average for Kissimmee from nine years of record--it is not clear if he had nine years of record for all of his stations. What is clear is that Wright ignored data provided by one of his subordinates. John Stewart's 1907 report included rainfall tables for Kissimmee (January 1898 through March 1907), Ft. Myers (January 1898 through March 1907), Jupiter (January 1898 through March 1907), and Miami (January 1901 through March 1907). Examination of such tables reveals greater potential for excessive rainfall than Wright included in his abstract. At Jupiter, for example, September/October 1899 rainfall totaled 27.93 inches, and September/October 1904 rainfall totaled 30.31 inches. 1901 was a particularly wet year at Miami. Early wet season rainfall during May and June tallied 31.14 inches. After just over 8 inches in July, 26.15 more inches fell during August and September. Finally, during August/September 1905, Miami received 25.7 inches of precipitation. Stewart's data demonstrated that South Florida occasionally, if not frequently, receives more than 24 inches of rain during a two-month period.

Furthermore, although Wright claimed to have engaged in an extensive data hunting mission, Meade et al. (1912) argued that Wright failed to make use of all U.S. Weather Bureau records then available. Indeed, Wright's precipitation figures suggest that he relied entirely upon data culled from Stewart's 1907 report. Apparently both Wright and Stewart failed to locate rainfall data for Ft. Myers 1891 to 1897, and Miami for the 1850s, 1880s, and from 1895 to 1900. These data further demonstrate the potential for unusually large amounts of precipitation. For example, Ft. Myers received just over 30 inches of rain during June/July 1896, and Miami received the same amount during September/October of both 1874 and 1876. Moreover, Miami received over 9 inches during August 1878 and 25 inches the next month. These data illustrate that Wright's perceived two-month precipitation maximum of 24 inches was far too low.

Wright recognized the importance of evapotranspiration (ET) but conceded that nobody had ever estimated ET for southern Florida. He found ET studies that were conducted in Europe and in the northern U.S., and concluded that South Florida's ET rate must be approximately 75% of its annual precipitation. This figure is very near Dohrenwend's (1977) estimate for actual ET. Moreover, Wright realized that in order to drain the Everglades, he must remove runoff from not only from the Glades, but also from the Kissimmee River Valley and Lake Okeechobee. Unfortunately, Wright divided his assumed maximum two month total rainfall of 24 inches by 62 to produce a daily rainfall maximum, while subtracting 75% on account of ET--the remainder being runoff. After accounting for a planned storage capacity in Lake Okeechobee, he designed a series of canals that he thought was capable of removing excess runoff from the entire Kissimmee

River--Lake Okeechobee--Everglades watershed. Wright's figures implied that the two-month rainfall maximum of 24 inches would be spread out evenly throughout the 62 days in July and August (less than .4 inches per day). Stewart's precipitation tables include the 24-hour maximum for each month. Values of three to four inches during a 24-hour period usually occur at least once each year throughout South Florida, and Fort Myers received 11.7 inches during one 24-hour period in June 1901. Wright did not explain how long it would take to remove runoff from such storms.

After warning that it was not possible to determine the exact amount of excavation necessary for each canal, Wright thought that sufficient data existed to compute the probable cost of excavation. In essence, he repeated Broward's contention that the main components of the Everglades drainage system could be built for an average cost of one dollar per acre drained. Wright added that farmers should expect to spend between two and four dollars per acre in excavating their own ditches to lead into the main canals (p.23-24).

As the State of Florida distributed several thousand copies of Wright's abstract to interested parties, Charles G. Elliott (Wright's supervisor) gave the engineering figures in the report only cursory review as it was prepared for publication. One of Elliott's subordinates, an engineer named Arthur E. Morgan, later testified (U.S. House 1912, p.353) that on account of the increasing demand for wetland drainage, Elliott was overwhelmed with work and simply trusted Wright's engineering ability. After all, Morgan noted, Wright was a gifted public speaker and had nearly 25 years of experience in drainage work. A.D. Morehouse, one of Morgan's co-workers, concurred, maintaining that "Mr. Elliott could not possibly give his undivided attention, or very much of his attention, to any one particular thing, and had to depend to a very, very large extent on his subordinates" (U.S. House 1912, p.523). Shortly before Wright's full report was to be printed during the late summer of 1909, a land promoter visited Washington and expressed concern over Wright's calculations (Dovell 1947). This led to a more thorough examination of the report, a delay in its publication, and a feud between Wright and Elliott. Wright steadfastly maintained that his original report was correct and initially refused to make any alterations. Furthermore, he pointed out that the U.S. Department of Agriculture had sent out an excerpt of his forthcoming report that Florida officials had published and widely circulated. "I took the stand," Wright contended, "that it would put the department in an embarrassing attitude to issue a thing and then come out and state it was inaccurate and should be changed" (U.S. House 1912, p.291).

By January 1910, USDA's Drainage Investigations unit was buried with requests for information regarding the Everglades. In order to handle such requests more efficiently, Elliott authorized a form letter to be sent in response to all inquiries about the Glades (U.S. House 1912, p.140). Later known as the Elliott circular, the letter was drawn from information in Wright's forthcoming report as well as from previous responses to inquiries. It also included several statements that drew the ire of land promoters who were selling cheaply aquired wetlands for profit on the pretense that the land would soon be drained. Among other things, Elliott's circular noted that "the long and hot summers are usually very irksome to the people from more northern states, but do not seem detrimental to the health." Perhaps even more offensive, as far as land sellers were concerned, were statements of caution. "A number of miles of canals have been excavated, and it does not seem improbable that as this work progresses the land bordering the canals will be at least partially drained. But undoubtedly much more time will yet be required before any considerable areas will be habitable or fitted for cultivation." Finally, Elliott made clear that "the value of the lands when drained is still largely problematical." Willis (1912 p.15) summarized the circular thus: it "contained exactly the information the land speculators did not wish the investing public to know." Secretary Wilson was bombarded with requests to suppress Elliott's circular. One of these requests came from W.L. Bowen in a letter to Wilson dated 18 May 1910 (U.S. House 1912, p.1027). "You doubtless appreciate the fact that the success of the project depends largely upon public confidence in its wisdom and ultimate success. . . ." He argued that when government employees knock the project, it appeared that the government knocked the project. "And you will readily understand," Bowen continued, "that whatever tends to destroy such confidence and to discourage prospective investors tends . . . to defeat the entire enterprise and leave the vast and fertile Everglades region a permanently uninhabitable waste" (p.1027). A few weeks after Elliott's circular appeared, Florida's Senator-elect Duncan U. Fletcher visited Secretary Wilson who promptly ordered the circular discontinued (Dovell 1947).

Meanwhile, Elliott prepared a revised edition of Wright's report in late January 1910, which he passed on to Secretary Wilson for approval. At the same time, some of South Florida's large landowners met in Tallahassee to negotiate a settlement with the state over Everglades Drainage District taxes which they had not paid since the district's inception in 1907. They began to see opportunities to make substantial profits selling their holdings in southern Florida. Lawrence E. Will claims that gardens tended by the wives of fisherman along Lake Okeechobee's south shore produced so well that people soon realized the soil's potential for farming (Lawrence E. Will, Personal and Public Papers). In any event, as part of the settlement between the state and landowners in the Everglades Drainage District, both parties agreed to hire James O. Wright to direct Everglades drainage. Those interested in Everglades drainage believed they had a friend in Wright who was clearly in favor of the project. Wright provided Everglades promoters (including state officials) exactly what they wanted: an engineer who believed in Everglades drainage--one who investigated the Glades while in the service of the federal government. In addition, by late May 1910, Secretary Wilson had given Everglades promoters all they could have asked for: he had authorized an excerpt of Wright's glowing report on the Glades to be sent to Florida, and then suppressed both Elliott's circular as well as Elliott's revision of Wright's report--both of which contained several statements of caution regarding the project. Wilson later denied accusations that he suppressed Elliott's circular and revision of Wright's report at the request of Everglades land promoters (U.S. House 1912, p.1318).

By 1911, the Glades had attracted nation-wide attention and demands for information poured into government offices in Tallahassee and Washington, D.C. Senator Fletcher convinced Congress to print a compilation of official documents and reports on the Everglades (Dovell 1947). This collection of Everglades material was printed in August 1911 as *United States Senate Document 89*, and included Wright's unrevised report. Although Everglades promoters eagerly seized the opportunity to publicize Wright's favorable report, appearance of the document was, in some ways, anticlimactic. To begin with, Wright had already been hired by Florida to direct drainage operations. Presumably, drainage was feasible and his ideas were already being implemented. Moreover, with only 41 pages of text, the full report contained scarcely more information than the abstract. Indeed, Wright's report is more remarkable for what it failed to address than for its actual content. For instance, Wright acknowledged that sedimentation and aquatic vegetation had become serious problems in Disston's canals; yet he ignored maintenance costs for canals in the Everglades. Furthermore, apparently unaware of the soil subsidence problem in English fens, Wright neglected the impact of shrinking soils on the ability of canals in a nearly flat landscape to remove excess water. Finally, as in the abstract, Wright failed to account for the impact of tropical storms.

In any event, prior to 1909, the number of landowners in the Everglades could be counted on two hands (Dovell 1947, p.230). Most of these landowners controlled thousands of acres and created land companies to sell cheaply acquired land for profit. One of the sales techniques used in the early years (1909 to 1912) was to take tourists on guided tours to Lake Okeechobee. Richard Bolles built a two-story hotel on the Lake's southern shore to house guests. Early Everglades pioneer Lawrence E. Will (1965a p.73) later observed that "at this time about all you could see {from the lakeshore} was some custard apple swamp, and the Bolles Hotel, and {A.V.} Callahan's garden." These companies also produced reams of advertising material in an effort to attract buyers. For instance, the Everglade Land Sales Company published the *Everglade Magazine* and the

Florida Everglades Land Company published the *Florida Everglades Review*, both monthly magazines. Other companies, with similar sounding names, prepared pamphlets and brochures advertising their lands. J.H. Whitney (1910) acknowledged that several companies published magazines and pamphlets boasting about the region and that many of these sadly misinformed the public. Whitney insisted that the mission of his magazine was to "make this a truthful and correct exponent of the Glades" (p.8).

What follows is a discussion of early 1910s Everglades promotional material and its intended audience. Most of this literature displayed an unshakable belief in progress. The *Florida Fruitlands Review* (1909 p.7) editorialized that "it has only remained for the engineering genius of man to reclaim this land, relieve it of its excess moisture and deliver over to a waiting people a potential Garden of Eden." In *Everglade Magazine*, Vance W. Helm (1911 p.8) added that "the Everglades of Florida are going the way of that Great American Desert whose waste aridity was described in the school geographies of our fathers. . . ." Finally, Holland et al. (1910 p.8) boasted that "three million acres of the richest land are now waiting the magic touch of the hand of man to transform it into the paradise for which it was intended."

Much promotional literature rejected the use of the word "swamp" in conjunction with the Everglades. "The Everglades are not an oozy swamp," stated the editor of one pamphlet (*Everglades* 1910, p.3), "but a HIGH LEVEL PLATEAU." In another pamphlet, Holland et al. (1910 p.14) authoritatively proclaimed that the Glades were not a swamp because "a swamp is land covered with stagnant water. The water covering the Everglades is not stagnant, but is fresh and sweet with a constant flow toward the sea."

Vance Helm (1911 p.2) insisted that "contrary to popular belief, the Everglades are not a swamp, but OVERFLOWED lands." Editors of the *Florida Fruit Lands Review* (1909) argued that the Glades are not a swamp or marsh, as popularly supposed. It is an elevated basin which only looked like a marsh or swamp because of the presence of sawgrass and cypress trees!

It is hard to understand why any one would try to make South Florida's climate sound better than it really is, but early Everglades land sellers boldly proclaimed the absence of frost and declared that the region's long, hot and humid summers were comfortable after all. For example, Whitney (1910 p.5) maintained that the average summer temperature for southern Florida "ranges from 70 to 80 degrees and seldom does the mercury go above the latter figure." The Everglades Land Sales Company (*Where Nature Smiles* 1910, p.17) was less daring, remarking "that summer temperatures in Miami exceeded 90 degrees only 20 days per year." In fact, during the summer of 1907, the daily maximum temperature in Miami exceeded 90 degrees 32 times, and during the summer of 1908, the temperature at Miami exceeded 90 degrees 51days (U.S. Department of Agriculture 1907 and 1908).

In 1910, the Florida Everglades Reclaimed Land Company stated that "there has never been a frost that killed the tenderest vegetation" (*Everglades* 1910 p.3). By late 1914, however, it had become clear that the region occasionally endured freezing weather. In their pamphlet entitled *The Garden of the Glades* (1914), the Okeechobee Fruit Lands Company declared on page six that frosts occurred in the Glades "at rare intervals only." Yet the following disclaimer appeared on page 14: "for the last year or two frosts have been more frequent and have damaged and in some cases caused serious loss to some of the vegetable crops in different localities in the Glades." Without listing the crops that had been damaged, they suggested that "there are so many other profitable crops which can be grown, and which are not at all affected by these light frosts." It remained for the reader to determine which crops might escape frost damage.

Promoters regularly implied that all of South Florida had marvelously productive soil. The *Everglade Magazine* quoted J.H. Worst (1911 p.7), President of the North Dakota Agricultural College: "I never saw finer fruit than on the muck lands adjacent to Miami and Ft. Lauderdale. Presumably, the same will prove true anywhere on the 'Glades. . . ." Editors of *Florida Fruit Lands Review* (1909 p.3-4) boasted that "the remarkable soil with little expense of preparation and no fertilization will produce ANY crop to which the country is adapted, on a basis of profit heretofore almost unknown." They also claimed (p.7) that the soil was over 10 feet deep in places and, therefore, "absolutely inexhaustible." Holland et al. (1910 p.7) agreed, mistakenly adding that "this soil contains every element necessary in perfect 'growing' land, and contains these elements in the proper proportion."

Because there were practically no trees to clear in the Glades, and because it was assumed that the soil required practically no fertilizer, the Everglades were offered as a poor man's paradise. "All the work the homesteader must do to put his land in shape for cultivation," declared Holland et al. (1910 p.13), "is to burn the saw grass which he will find growing upon it." Moreover, the Everglade Land Sales Company prevailed upon Walter Waldin (1910) to write a book about his farming experience on the edge of the

Glades. Waldin had apparently been quite successful raising vegetables on his farm in Davie, eight miles west of Ft. Lauderdale (Figure 3). In Waldin's opinion, "a man can, if he has strength, perserverence, and knows the business, make a fortune here with but little capital" (p.12).

Most promotional material contained several references to alleged experts in an attempt to lend credibility to the project. Former Cornell University forestry professor and early South Florida booster John C. Gifford wrote several short articles about the Glades, many of which appeared in promotional literature. Several of these were assembled as a book entitled *The Everglades and Other Essays Relating to Southern Florida*, published by the Everglade Land Sales Company in 1911, with a second edition appearing in 1912. In the spirit of conservation typical of his generation, Gifford asserted that "the coming age is to be an age of conquest, the conquest of nature, the reclamation of swamp lands and irrigation of deserts" (Gifford 1912, p.102). In a statement that many Glades farmers later wished they never heard, Gifford insisted that "owing to the sweetness of the fresh soil, a good crop can usually be produced on Everglade muck the very first year" (p.151). Gifford sincerely believed that the Everglades would make a fine home for people of limited means, later writing passionately about his proposed tropical subsistence homestead (Gifford 1934).

Real estate companies made extensive use of an obscure report on Florida's mucklands prepared by H.W. Wiley of the USDA's Bureau of Chemistry in 1891 (as quoted in U.S. Senate 1911). Many Everglades promoters found the following passage from Wiley's report particularly useful:

> there is practically no other body of land in the world which presents such remarkable possibilities of development as the muck lands bordering the southern shores of Lake Okeechobee. With a depth of soil averaging perhaps, 8 feet, and an extent of nearly half a million acres, with a surface almost absolutely level, it affords promise of development which reaches beyond the limits of prophecy (U.S. Senate 1911, p.79).

Most promoters simply eliminated Wiley's "half a million acre" comment because they wanted to create the impression that all of the Everglades (a few million acres) had the qualities Wiley attributed to them 20 years earlier (see Holland et al. 1910, p.5 and *Where Nature Smiles* 1910, p.4).

The *Florida East Coast Homeseeker* went even further in their attempt to give Everglades drainage official standing by attributing the following statement to James Wilson, the Secretary of Agriculture:

> there is no large body of land lying within the boundary of the United States--in fact, not in any portion of the world--that will, when the drainage is completed, be of so great value as the once-despised Everglades of Florida. . . . The doubting Thomases who are standing back and awaiting developments will in a few years see the folly of their acts and for the rest of their natural lives will regret that when they had the opportunity of purchasing these lands at a nominal figure they had not done so (as quoted in U.S. House 1912, p.1322-3).

Wilson later denied making such statements, but once in print, others simply lifted quotes from the originally published source. For instance, the Florida Everglades Reclaimed Land Company made use of the statement attributed to Wilson in an advertisement in a Pittsburgh, Pennsylvania newspaper in 1911. "Secretary Wilson, of the United States Department of Agriculture says the doubting Thomases who are waiting for the Everglades to develop before buying will regret it all their lives" (as quoted in U.S. House 1912, p.1323).

Everglades boosters even tried to use nationally recognized politicians to sell land in the Everglades. Such was the case when three-time presidential hopeful William Jennings Bryan bought land in South Florida. Vance Helm (1913 p.6) commented on Bryan's purchase thus: "when such men as W.J. Bryan come to Dade County, Florida, after having seen all the states in this Union, and buying lands here and there for immediate development, it means that what has been said of this State is not a visionary fancy of the impractical poet; but that it is a land where intelligent methods will insure agricultural success."

It appears as if most Everglades real estate companies made a special effort to glorify James Wright, the drainage engineer hired by Florida to direct drainage work in the Glades. Although Wright's title while working for the government was "Supervising Drainage Engineer," this was a middle level position within the USDA's Office of Experiment Stations, Drainage Investigations unit. Yet the Everglade Land Sales Company claimed Wright was "recognized as one of the best posted experts on drainage in the world" and that he was formerly "Supervising Drainage Engineer of the United States Bureau of Reclamation" (*Where Nature Smiles* 1910, p.16). The *Miami Metropolis* (4 Feb 1910, p.1) went a bit further, claiming that Wright was in charge of the U.S. Bureau of Reclamation! J.H. Whitney (1910 p.5) of the Florida Everglades Land Company confidently asserted that Wright was "a drainage engineer with a national reputation and life long experience in such work."

Having portrayed Wright as an authority on drainage, land companies implied that Wright's comments regarding the Glades were definitive. Whitney (1910 p.5) illustrated this point: "recognizing that in his position as Supervising Engineer of the Everglades Drainage, Major Wright can not afford to give out an exaggerated statement, his valuation of the land should be accepted as conclusive proof that the buyers of Everglades, hold the most valuable assets obtainable." Wright apparently reveled in the limelight, providing newspapers, real estate men, and others with a mountain of material to broadcast.

Speaking before the State Banker's Association in Pensacola, Florida in May 1910, Wright expressed his belief in reclamation projects everywhere. "I do not know of a single instance in which a comprehensive plan of drainage of swamp-land has been conceived and carried out that the lands have not been reclaimed and made valuable" (*Miami Metropolis* 13 May 1910, p.5). Wright's comments filled the pages of pamphlets and other Everglades advertising material. For example, the Everglade Land Sales Company quoted Wright's response to one correspondent: "there are no engineering difficulties whatever to overcome in draining the Everglades. The elevation of Lake Okeechobee is 21 feet above sea level, and it is a well established fact that if sufficient canals are dug that water will run down hill" (*Where Nature Smiles* 1910, p.16). Two years later, Wright continued to boast of the project's ultimate success. The front page headline for the *Miami Metropolis* on 5 April 1912 blared: "**Everglades will never overflow again after this year is the belief of engineer Wright.**" Inasmuch as Wright made similar comments before Congress in 1912 (U.S. House 1912), it is unlikely that land promoters bothered to misquote or use the engineer's comments out of context.

It is difficult to assess the influence of Everglades promotional literature on people's perceptions of the Glades during the early 1910s. Surely no one believed all that was claimed of the Glades. The *New York Times* (13 Feb 1912 p.10) warned that "nowhere does the purchaser who isn't on his guard stand in greater peril when he acts on statements which are false only because they are not the whole truth." Yet such literature must have had an impact because by 1912, thousands of people had purchased land throughout the Everglades. Furthermore, Florida's reclamation activities were beginning to yield tangible results. In April 1912, amid much fanfare, South Florida celebrated the opening of the North New River Canal (Figure 5; Larkin 1912). A year later, workers completed the Miami canal (Figure 5).

Miami resident Margaret Topham wrote Secretary Wilson on 13 November 1910, summarizing what she witnessed.

> Can not this department take some measure to force the stoppage of sales of so-called drained Everglades lands? Not a day {goes by} but some poor, deluded victim arrives here in Miami to find the acres which he has bought, and which have been described to him as a very gold mine for productiveness, sometimes as much as 8 feet under water, and with no present prospect for that water disappearing. These land companies are flooding the country, particularly the Middle West, with the most fabulous misrepresentations. We who live here know how absolutely cruel the sufferings of those misguided creatures. The Everglades may be drained some day, but that day has not arrived (as quoted in U.S. House 1912, p.1263).

Although South Florida has since become a haven for foreigners and people from the northeast U.S., Topham believed that many Glades buyers came from the Midwest. Is this true? Two pieces of evidence suggest as much. First, in early 1912, the *New York Times* (28 Jan 1912 p.14) reported of the Glades that "much of the region has been platted and sold to prospective settlers, who number about 3,000 and hail largely from the Middle West."

Second, early Everglades pioneer John Newhouse (n.d.) prepared a manuscript entitled *1912 Land Buyer's Convention West Palm Beach, Florida*, based on a booklet published by the Florida Everglades Land Company. Newhouse's manuscript contains important geographic information: it lists the number of conventioneers from each state in the union as well as those from foreign countries.

Heiney (1978) discussed the details of a similar convention in 1911 at Ft. Lauderdale. Nearly 3,000 conventioneers assembled at the sleepy, South Florida village of just 150 people in March 1911. Like other land companies, the Florida Fruit Lands Company sold contracts to purchase at least ten and up to 640 acres of land in the Glades for the set price of $240. Buyers were attracted by the possibility of receiving one of the few 640 acre plots at the lottery in Ft. Lauderdale. Since the Everglades had not yet been surveyed, however, no one knew the exact location of individual purchases. This caused much dissatisfaction when it finally became known that many tracts were isolated and under water.

In any event, 4,464 Everglades buyers attended the 1912 West Palm Beach convention and Figure 41 illustrates that there were more Midwesterners than people from any other region. Illinois, Kansas, Iowa, Missouri, and Minnesota accounted for over half of the people present. One might have expected that Everglades buyers would hail from states closest to Florida--the southeastern states. This did not happen. Yet one might be able to explain the distribution of Everglades buyers in terms of the population of other states; perhaps the Everglades attracted more buyers from states with more people.

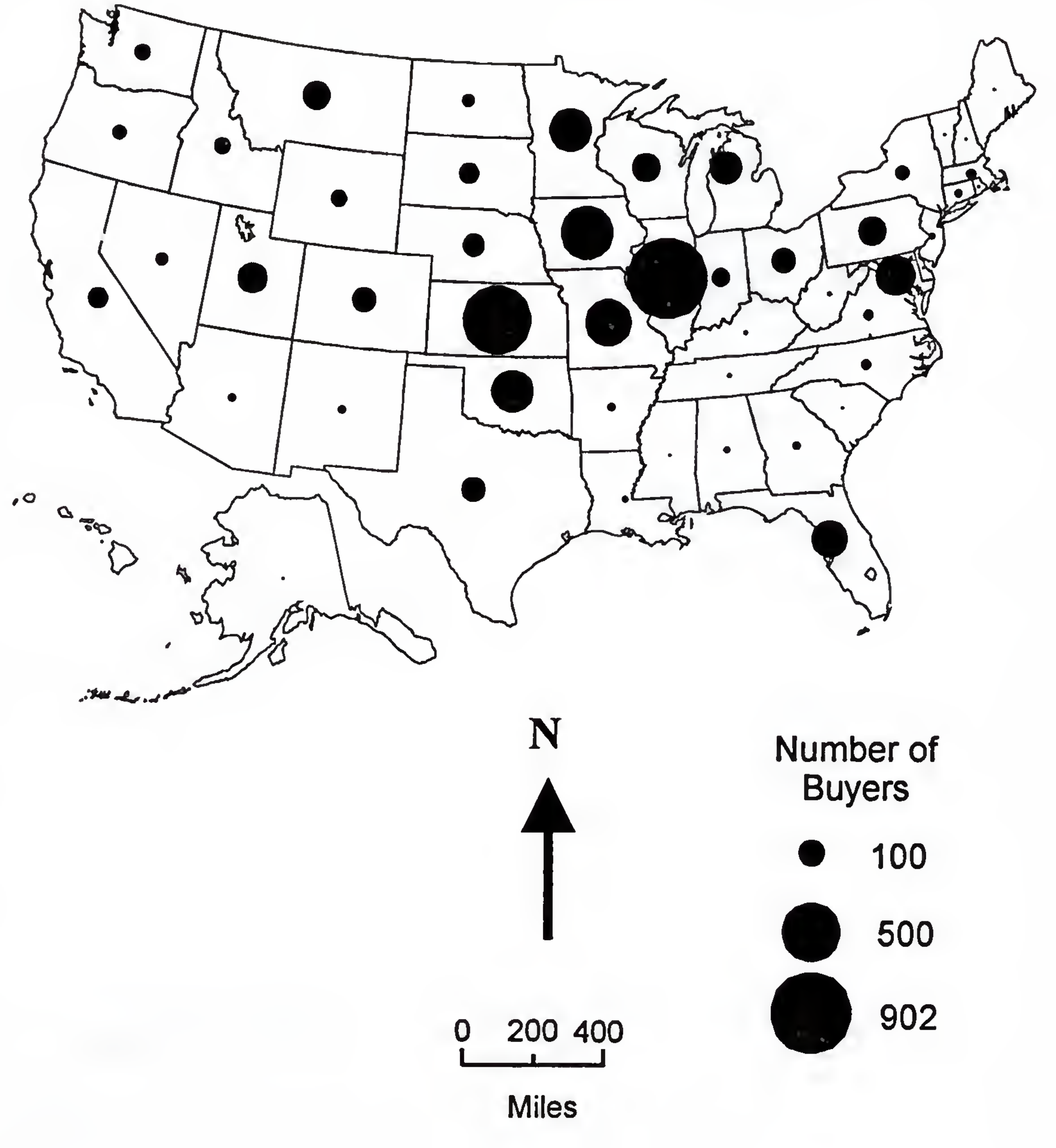

Figure 41. Total number of Everglades buyers at the 1912 convention in West Palm Beach.

To test this hypothesis, a location quotient (LQ) was determined for each state. According to Barber (1988), the location quotient is an index for comparing an area's share of a particular activity (Everglades buyers) with the areas's share of some basic phenomenon (population). In this case, an LQ of one would mean that a state contributes an "even share" of Everglades buyers based on its population relative to the number of Everglades buyers and populations of other states. Location quotients for all 48 states plus Alaska, Hawaii, and Washington, D.C. were calculated using the following equation:

$$\text{Location Quotient}=\frac{(\text{Number of Glades Buyers from State X/Total Number of Glades Buyers})}{(\text{Population of State X/Population of the United States})}$$

Since the land buyer's convention took place in 1912, census figures from 1910 were used to calculate each state's location quotient (U.S. Department of Commerce and Labor 1914). For example, Colorado had 83 of the 4,805 buyers from the United States and 799,024 of the nation's 92,228,891 people. After substituting these numbers into the equation above, it is determined that Colorado's location quotient is 1.99, or almost 2. This means that Colorado supplied almost twice as many Everglades buyers at the 1912 convention in West Palm Beach as one might expect based on the state's population.

Figure 42 is a choropleth map of the calculated location quotients for each state. Almost all states east of the Mississippi River contributed proportionally fewer Everglades buyers than expected based on their total populations. Perhaps the more frontier oriented residents of the western and midwestern states viewed the Everglades as a "last frontier."

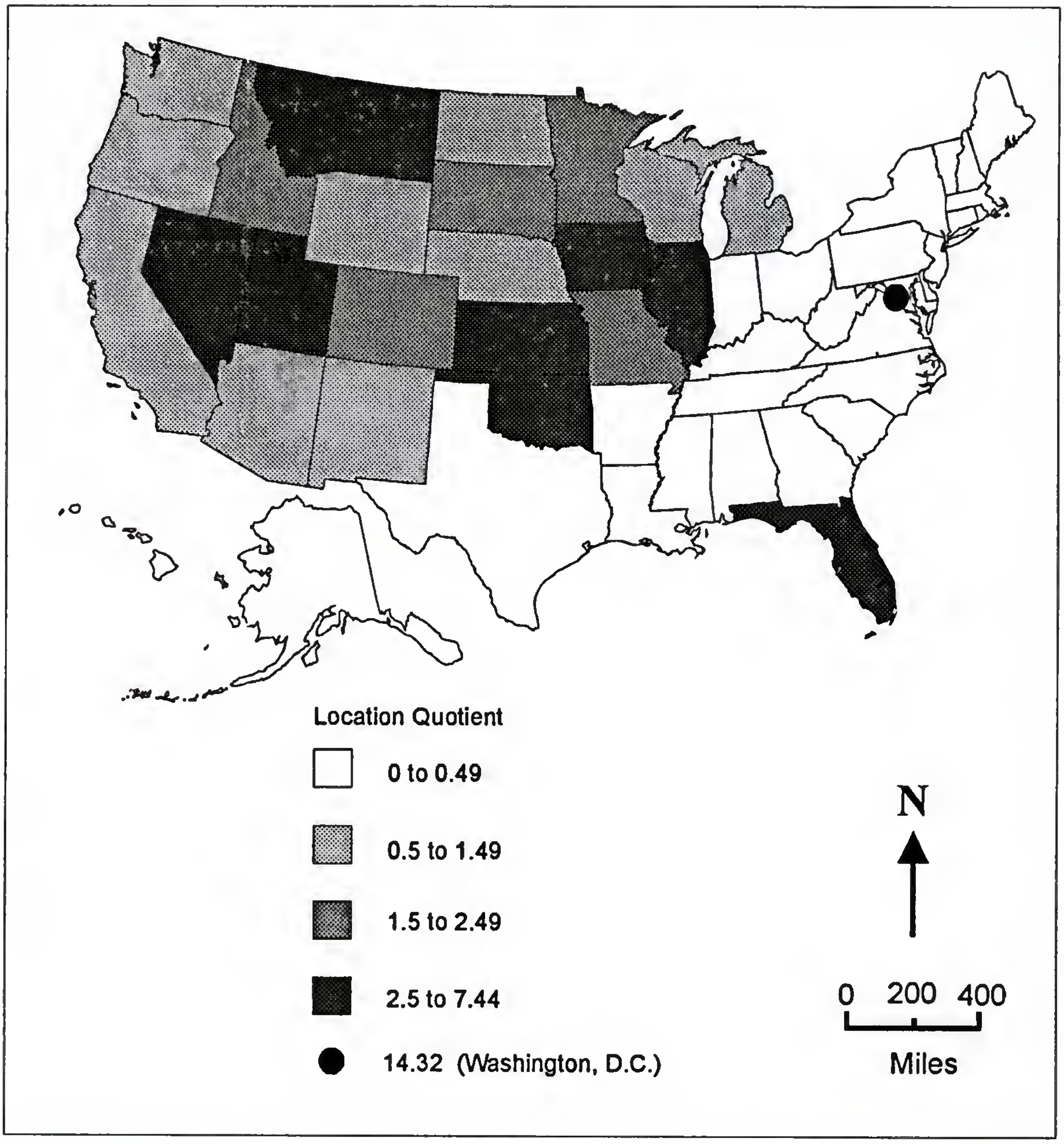

Figure 42. Choropleth map of the location quotients derived for each state based on the number of Everglades buyers at the 1912 convention in West Palm Beach.

Washington, D.C. led the nation with a location quotient of over 14--reflecting the activities of Thomas Will and his friends before they moved south. Moreover, none of the southeastern states (except Florida) had a location quotient of higher than 0.17. Although Floridians who were born in the South (including Florida) may have contributed to the state's relatively large number of Everglades buyers (Florida LQ=4.9), Figures 41 and 42 suggest that Floridians who migrated from more northern or Midwestern states were the "Floridians" buying land in the Glades.

In spite of all the enthusiasm surrounding Everglades drainage from 1909 to 1912, the project's enemies continued to raise questions. Real estate promoter Vance Helm described the situation in the December 1911 issue of *Everglades Magazine* (p.2). "An attack upon the reclamation of the Everglades has been made lately. Part of the attack seems to have been made because of political warfare, and part from the differing views of engineers as to the proper method of reclamation and possibly to greed and local jealousy on the part of unscrupulous land speculators in the state at large." Among other things, Helm alluded to the growing feud between Senator Fletcher, who supported Everglades drainage, and Florida Congressman Frank Clark, who bitterly opposed the project. The *Miami Metropolis* (16 Feb 1912, p.1) characterized Clark's attitude thus: "the only logical conclusion for an outsider to draw from the attitude taken by Mr. Clark," the editor asserted, "is that the drainage of the Everglades is very doubtful, in fact, only a remote possibility, that the soil is valueless, imflamable peat, even though drainage were possible, and that the only way to make it productive would be by expensive application of fertilizer administered by an expert." Finally, Dovell (1947) documented further evidence of disagreement regarding the Glades in the periodical literature of the time.

Newspaper editorials and even promotional material give additional evidence of disagreement over the Glades. For example, John Gifford (1911 p.6) angrily denounced opponents of Everglades drainage. “Let me say that this Everglades drainage question is no question at all; it is a question only in the minds of doubting Thomases who are prejudiced, who are ignorant, or who are born knockers and who belittle every project in which they have no hand and out of which they can make no rake-off.” The *Miami Metropolis* (1 March 1912, p.2) reprinted a generally favorable editorial regarding Florida that originally appeared in the *Cincinnati Enquirer*. Yet near the end of this piece, even this author expressed concern over the Glades. “Florida has so much good, rich land that requires no draining . . . that the State and its people have undoubtedly suffered great injury through attempts to unload upon unwary customers land that is in no condition to produce at this time.” Finally, the *Miami Metropolis* denounced the *Kansas City Star* for printing anti-Everglades editorials (*Miami Metropolis* 1 March 1912, p.8). “Letters from irresponsible or disgruntled persons who become homesick away from Missouri and frightened at the prospects of work are treated as seriously as though they were the truth.”

By early 1912, debate over Everglades drainage reached fever pitch. The USDA had spent over $11,000 investigating the Glades since 1906, but Secretary Wilson refused to authorize either Wright’s report or Elliott’s revised version. Indeed, Secretary Wilson had Elliott’s circular letter on the Glades suppressed and land promoters continued to make substantial profits from land that remained under water. Accordingly, the *House Committee on Expenditures in the Department of Agriculture* conducted hearings on the Everglades from February through August 1912. The *New York Times* (13 Feb 1912 p.10) reported that "not a word, curiously enough, has come from the speculative dealers in Florida lands since the outbreak of the latest storm in the Department of Agriculture. They are lying extremely low and saying nothing."

James Wright was the first witness called by the committee. One Congressman asked the engineer if a project of this magnitude would not require a tremendous amount of data. Remarkably, Wright replied that "the engineering problems, on the contrary, are quite simple." Echoing Napoleon Broward, Wright added that "the water runs down hill in an open channel, and that is about all there is to it--just cutting the canals" (U.S. House 1912, p.137). The committee also probed Wright's previous business connections with real estate promoters in Ohio and North Carolina while engaged in government financed engineering work for the land in question. Suspecting that Wright may have worked too closely with Everglades land promoters while preparing his report, a majority of the committee concluded that "these transactions of Mr. Wright are repugnant to the high sense of honor and propriety which ordinarily distinguishes the conduct of Government officials, and cannot be too severely condemned" (U.S. House 1912, p.5).

The committee then heard the testimony of another engineer from Wright's office, Arthur E. Morgan. Morgan asserted that "I regard Mr. Wright as absolutely and completely incompetent for any engineering work" (U.S. House 1912, p.335). When asked if he thought Everglades reclamation was possible, Morgan responded that he thought so, but that far more data should be secured to ensure the success of the project. Morgan (as quoted in U.S. House 1912, p.466) summarized his unshakable belief as well as his reservations concerning the Everglades in the following statement:

> This reclamation can be made successful by the development of a system of agriculture which is suitable to those conditions; that development will be a commercially slow process and will take a considerable number of years. There are a good many questions to be worked out that have not been worked out, and to put a great many small landowners on 10 or 20 acre tracts without knowledge of the conditions, will mean a loss of investment to those landowners; but as the methods of handling the Everglades are developed, the reclamation of the Everglades will probably be feasible, and the State ought, by all means, to continue its efforts along those lines. But it ought to be better advised than it has been, and it is of doubtful wisdom to provide for selling to a great many small landowners land which is difficult to subdue and which requires special ability in handling it and concerning a good deal of which very little is known.

Morgan was not the only engineer in the USDA's Drainage Investigations unit who questioned Wright's ability. A.D. Morehouse added that "I had been impressed that he was a very ready talker, indeed; but had never been particularly impressed as to whether his talk could be backed up with real engineering knowledge or not" (U.S. House 1912, p.521). After examining Wright's report in detail, the chief of USDA's Drainage Investigations, Charles G. Elliott, claimed that he determined Wright to be incompetent in late 1909 (U.S. House 1912, p.991). In Elliott's opinion, "examinations of this great area have not been made in sufficient detail to secure the facts that are necessary to an intelligent design of a drainage plan for the Everglades" (U.S. House 1912, p.987). He contended that a proper report would cost $150,000 (rather than $11,000) and take much more time than was spent on the report that was never published (U.S. House 1912, p.829). Elliott never spoke out against Everglades reclamation and he agreed with Wright's basic plan for drainage; but he believed that many of Wright's statements required heavy qualification, which is what his revision of Wright's report in January 1910 included. For example, regarding cost estimates, Elliott included the following statement in his revision of Wright's report: "it should be understood that the estimates of the amount of excavation and the cost of the work are based upon extremely meager information" (as quoted in U.S. House 1912, p.987-8).

By August 1912, after listening to testimony from over a dozen other witnesses, a majority of the committee reached the following conclusion: "the work of the engineers in the field . . . was not sufficiently comprehensive or painstaking to secure data for accurate scientific planning of this great work of reclamation" (U.S. House 1912, p.2). Even a dissenting minority of the committee admitted that the government's investigation of the Everglades was "unsatisfactory" (U.S. House 1912, p.13). Within months, James Wright resigned in disgrace as Florida's chief drainage engineer and the continuing controversy took the wind out of the Everglades balloon.

Suddenly, there appeared to be major questions surrounding Everglades reclamation. After the Congressional committee's hearings in 1912, Vance Helm of the Everglades Land Sales Company employed a trio of engineers to conduct their own investigation of the Glades. Daniel Meade, Allen Hazen, and Leonard Metcalf (1912) responded with their findings on 12 November 1912. Dovell (1947) ably described Meade, Hazen, and Metcalf's report which was a scathing review of Everglades drainage up to that time. These engineers believed that the Glades could be drained, but they found the present and projected system of canals totally inadequate. They called for pumping stations, dikes, and many more ditches. It is difficult to determine how many people saw the report; although Helm and his associates soon adopted many of its suggestions on their company's land, the report does not appear to have received much attention in the press. Apparently the *New York Times* (1 Nov 1913, p.18) did gain access to Meade, Hazen, and Metcalf's report and summarized the Everglades problem thus:

> It is difficult to discover a more emphatic lesson of the importance of a thorough study of rainfall and runoff in drainage and irrigation than is afforded by the work upon which the State of Florida has embarked. . . . The result of this engineering blunder has been to involve the State of Florida in something approaching a land scandal, to bring the men engaged in a legitimate real estate development into a most disagreeable position, and to lead many thousands of people to invest in swamp land in the belief that it was ready for market gardening.

CHAPTER 5
PERCEPTIONS OF THE EVERGLADES FROM 1912 TO 1930

Permanent American settlement in the Everglades began in earnest after 1912, and scholars are fortunate to have letters, books, and memoirs written by some of those involved in settling the Glades. For example, pioneer John Newhouse wrote several unpublished manuscripts based on his experience in the Glades (1952, 1949, 1932, no date). Twenty years after completing his Ph.D. dissertation on the history of the Everglades (1947), historian Junius E. Dovell prepared a biographical essay on Newhouse, one of the earliest permanent settlers in the Everglades (Dovell 1967). Dovell noted that Newhouse was born in the Netherlands in 1880 and that he first moved to South Dakota before entering the Glades in 1914. Newhouse worked at a hotel, clerked in a general store, served in land surveying crews, worked as a corporate farmer, found employment as a handy-man at an agricultural experiment station, and then retired--all in the Everglades. According to Dovell, Newhouse lived simply: he never owned a car, never married, and there is no evidence that he ever left South Florida after 1914. Dovell made extensive use of Newhouse's 1932 manuscript in his dissertation, but he focused on pioneer activities rather than attitudes. Moreover, Newhouse wrote several additional manuscripts after Dovell completed his dissertation.

Much less is known of R.H. Little, who purchased land in the Glades during 1910, and later retired there. He wrote a 169 page manuscript (Little 1938) outlining his thoughts and activities in the Glades during the 1910s and 1920s. The Historical Records Survey of the Works Progress Administration prepared a typewritten copy of Little's story during the Great Depression.

Another Everglades pioneer, Lawrence E. Will, was among the first to settle the sawgrass country below lake Okeechobee, and he spent most of his adult life in South Florida's interior. He worked (among other things) as a farmer, supply boat captain, dredge operator, construction worker, and mechanic. Later in life, Will fancied himself a "Cracker Historian" writing several books about his experiences in the Everglades (Will 1968, 1967, 1965a, 1965b, 1964, 1961). Written in a very informal style, Will's books provide a window into this pioneer's mind.

Lawrence's father, Thomas E. Will, left a tremendous collection of personal papers to the University of Florida. Thomas Will spent the last 28 years of his life promoting Everglades development (Dovell 1948). His 40 boxes of papers are a veritable gold mine of information for those interested in the opinions of people Will corresponded with; and he wrote frequently to pioneers, state and local politicians, out-of-state investors, and residents of Florida's southeast coast. These papers shed much light on early 20th century perceptions of the Glades.

Moreover, the papers of drainage engineer Arthur E. Morgan show that the engineering community was far from agreement regarding drainage policy. Finally, travel literature, the writings of naturalists, and more government reports and hearings are combined with a smattering of other materials to more fully develop an idea of Glades perceptions from 1912 to 1930.

1912 to 1919: The First Years of Settlement

While living in Chicago shortly after the turn of the century, Little (1938) recalled becoming interested in the Everglades as a result of reading several newspaper and magazine articles. He and his wife were getting along in years and they were growing tired of city life, so they looked for a place to retire. They decided upon the Glades because its climate would permit them to enjoy an out-of-door life throughout the year. Little bought land with the understanding that reclamation would take a few years. The prospect of settling raw country like the Everglades did not bother Little or his wife: "we had experienced pioneering conditions on the prairies of the Northwest, where her parents and I had seen the wilderness develop into a prosperous community, with modern conveniences, within a period of ten years" (p.7). They figured that the Glades would develop even quicker.

Little remembered that a Chicago newspaper carried an article warning prospective Everglades purchasers to beware, but that few people heeded the warning. By early 1912, he traveled to South Florida to inspect his property. Little remembered that real estate sellers in Ft. Myers tried to convince him to buy land on the coast, arguing that the Glades would not be drained for another ten years. As part of his trip, he visited one of the so-called demonstration farms. "What I had seen here," Little insisted, "did more to convince me regarding the fertility of the soil than what I had learned from the land company's literature" (p.21).

Thomas Elmer Will became interested in the Everglades during 1909 while living in Washington, D.C. and serving as editor for *Conservation Magazine*. In the course of his duties as editor, he came across John Gifford's previously-mentioned article on the Glades and almost immediately became an enthusiastic Everglades booster. Will purchased land in the Glades and helped organize the Florida Everglades Homebuilders Association, a group of investors in Glades real estate. By the summer of 1911, Will was anxious to begin farming on the association's land. In a 5 July 1911 letter to fellow association member W.L. Vanola of Brooklyn, New York, Will argued that "it is vastly cheaper and better that one, or a few, backed by others, should do the experimenting and pioneering than that all, backed by no one, should abandon their incomes and do their own experimenting and pioneering." Herman Walker of Orange, New Jersey, was part of a "colony" of 16 people from Washington, D.C. who moved to South Florida to cultivate some of the association's land on the edge of the Glades near Davie, Florida (Figure 3). Will remained in Washington, busying himself with Everglades promotional activities and remaining in touch with Walker.

At the end of his first week in Ft. Lauderdale, Walker wrote Will on 19 November 1911. "This town is growing, but their are very few people who care or know anything about farming. It's the worst nest of real estate sharks I ever got into." Walker noticed the difference between the soils around Davie and the Everglades proper. Davie soils supported productive farms that land promoters passed off as "Everglades" farms, and Walker discovered that "the muck soil outside the Glades {in places like Davie} is a much different proposition from the sawgrass muck {of the interior}, as they call it here." Less than three weeks later Walker wrote Will again (7 December 1911): "This is not heaven," Walker admitted as he detailed problems with mosquitoes, red bugs, ants, malaria, poor quality water, and the fact that mules and horses simply sunk into the muck. The obstacles were no surprise, yet "they are somewhat more trying when one really meets them face to face, but part of the pleasure in winning is in overcoming the obstacles."

On 18 January 1912, Walker vented his disgust to Will. "While I have not lost my faith in the future of the Everglades, I have had my eyes opened to a lot of things since I came here." Walker claimed that he paid an "outrageously high" price for his land, and that most companies were having a hard time appeasing buyers who realized they had been deceived. "In view of the probability of a congressional investigation of land company methods, however, I am disposed to believe that all the speculative companies will be inclined to act rather decently from now on." Although Walker conceded that the Everglades Land Sales Company was probably better than most, he condemned their use of deception in a lengthy diatribe.

> The company's literature is not directly deceptive as to Everglades conditions, but is greatly so in bulk. The pictures, stories and experiences shown in the *Everglades Magazine* . . . are intended to convince the reader that these illustrate Everglades conditions. In fact, as I have told you before, there is as great a difference in the soil and conditions, between the muck farms on the river and creek bottoms and hammocks, and the sawgrass muck of the Everglades, as there is between the climate of Washington and Fort Lauderdale.

Walker candidly admitted that the whole Everglades proposition was experimental, but he maintained his faith in the region, asserting that it would produce almost anything once people learned how to farm it. Again attacking wholesale deception, Walker insisted that "there is not a farm of commercial size, and not an orchard of any size more than a few weeks old, anywhere in the Everglades, despite all the lurid literature. . . . the literature is a mass of glossy deception." Walker denounced living conditions, freight rates, the cost of clearing land, and the company's experimental farm in Davie--branding the latter a "joke." Of John Bryan, the superintendent of the experimental farm, Walker believed that he "is an ancient, bewhiskered cracker who has never grown anything but beans and tomatoes, is too lazy to talk, and knows less of agriculture and horticulture than my children."

Three days later (21 January 1912), Walker calmed down and probably realized that he must have alarmed Will greatly, so he wrote again--this time tempering his statements. "I am more than ever persuaded of two things: that this is a wonderful country, and that none of us yet understand or appreciate fully the possibilities of the Everglades. The problems to be worked out multiply every day. It is not an easy country to farm. We all have much to learn, in fact everything, and seemingly we must all learn it for ourselves."

As if there were not enough problems for Walker and other pioneers, the weather turned ugly. Walker complained to Will on 12 February 1912 that they had just endured their fourth freeze in the last six weeks and that it had rained several times per week during the previous month. "Many of the small settlers are wiped out and some have left, while others have neither money to go home or to plant another crop, and are being helped to a living by the neighbors." He still thought the association could make a return on its agricultural investment by producing crops for the spring and summer. Walker concluded that farmers on Lake Okeechobee's south shore had apparently avoided frost damage, and that he hoped to relocate there sometime after the summer.

Will replied to Walker a week later (19 February) expressing his surprise at the news of freezing temperatures. He claimed that according to the U.S. Weather Bureau, the lowest temperature recorded at Miami that month had been 40 degrees F. Walker wrote back on 22 February and confessed that he suspected something was wrong with the temperature reports from Miami. "They are, I fear, much like the summer and winter temperature reports from Atlantic City {New Jersey}, where they keep the official thermometer in a sun parlor in the winter and at the end of a mile long pier, well shaded, in the summer." On a more serious note, Walker insisted that he needed more money from the association in order to continue farming--money Will was having a hard time raising on account of the Congressional investigation.

Conditions apparently improved during the next month, and Walker wrote more encouragingly to Will. On 11 March, Walker predicted that the Congressional investigation would help the Everglades after all by arousing further interest in the region. Indeed, he added that "I never had more confidence in our enterprise or in the Everglades than I have today." Such confidence was short-lived because on 17 May, Walker informed Will that there were major problems. "Between the frost, the freaky season {weather}, and the bugs, we have little to show for our money and work except bills." With the arrival of spring (and competition from other producers), prices for what remained in the ground plummeted. "Our experience is not exceptional," Walker contended, adding that "there is not a farmer on the South Canal, I think, who has got his money back." Like many other pioneers, however, Walker tried to remain optimistic. "While this year's failure has ruined me financially, and left me with nothing in the world but debts, I still have hopes of getting my money back and making a profit within the next year."

Less than a month later, Walker had given up all hope. “I hate to tell you,” he wrote in an undated letter Will marked received 7 June 1912, “but we’re wiped out.” Walker claimed that three consecutive days of rain had raised water levels three feet, destroying everything. “I’m dead broke and hunting a job. Am in hopes of landing something in Washington and coming north very soon. Whether I will come back again is doubtful.” A few weeks later (20 June 1912), Walker added “It is my deliberate opinion that while we may live to see the Everglades project develop into something like what we have hoped it would be, there is much doubt about this, and it will be many years before any of the Glades land is worth anything like the price we have paid for it. I want to get out with a little skin left on me if I can.”

Walker was not alone. As noted earlier, the *Miami Metropolis* (1 March 1912) denounced the *Kansas City Star* for publishing what they considered “contemptible pieces of abuse and misrepresentation.” The *Metropolis* was particularly annoyed at the *Star* for publishing a letter written by a pioneer named S.A. Hughes. Hughes’s letter corroborates Walker’s experience and resulting attitude.

> We had another freeze and that just about finished what little we had left. We have become perfectly disgusted with the whole proposition. It was represented to us that we could grow crops without fertilizer, which is not true; also that we could raise enormous crops and get good prices and that is not true. . . . We are going to get out of here as quick as we can. I don’t think we will pay any more on the land. I don’t think the Everglades will be drained for a long time if ever (reprinted in the *Miami Metropolis* 1 March 1912).

Remarkably, Will’s faith in Everglades settlement and development remained unshaken. To him, Everglades settlement was a foregone conclusion. Like many people of his generation, Will assumed that the benefits of inhabiting a wilderness always outweighed the costs (both human and monetary). He wrote Walker on 26 June 1912: "perhaps consolation can be found in reflecting that this has been an *unusual* year, and the reclamation work still lacks a year of completion" (italics mine). Precipitation records for Ft. Lauderdale during 1912 are not complete; but data from Miami suggest that although rainfall in South Florida was above average during 1912, it was not necessarily "unusual" (Figure 29). Mean annual precipitation at Miami is just over 58 inches and during 1912, this station received approximately 68 inches. Although 1907 was dry year for South Florida, rainfall at Miami for 1906, 1908 and 1909 was 72, 85, and 76 inches respectively (Figure 29). In any event, Thomas Will spent over a year licking his wounds and preparing to plant another colony in South Florida.

John Newhouse (1952 p.17) maintained that throughout most of the 1910s, settling in the Glades was too risky for most people. "Although a few daring souls moved into the region around Lake Okeechobee, and on islands in the lake," Newhouse remembered, "the bulk of the purchasers stayed away." Meanwhile, Everglades development staggered as a result of negative publicity from the Congressional investigation, talk that the U.S. Post Office intended to investigate South Florida land sellers for fraudulent use of the mails (15 July 1911 letter from F.L. Floyd to the Everglade Land Sales Company, Thomas Will, Personal and Public Papers), and from the terrible experience of early pioneers. According to Blake (1980 p.113), "the whole operation depended upon faith, but by 1912 the required faith was beginning to collapse." Like a determined boxer with a battered face in the early rounds of a big fight, the Trustees of Florida's Internal Improvement Fund stood their ground and took steps to restore confidence in the Glades.

To begin with, it had become clear that drainage taxes and land sales would not provide enough money to complete Everglades reclamation. Therefore, the 1913 Florida legislature authorized the Everglades Drainage District to borrow money for drainage operations. Despite being authorized to sell $6,000,000 worth of bonds, the state discovered there were no buyers. Apparently the financial community had little faith in Everglades drainage.

In an effort to build the necessary confidence in Everglades drainage, the state hired three nationally recognized engineers, Isham Randolph, Marshall Leighton, and Edmund Perkins, to investigate the Glades and prepare a plan for drainage. The Randolph Commission, as the group became known, submitted their report to the state in late October 1913 (U.S. Senate 1914). Although these engineers paid far closer attention to periods of excessive rainfall than did Wright, they lamented the fact that they did not have enough time to do a thorough study. “The necessity for an early closing of the investigations has rendered it impossible to present fixed conclusions” (p.41). Yet unlike pioneers who had been flooded and frozen out of the region during the previous year, the Randolph Commission insisted that the Glades could be drained and turned from a watery waste into fertile fields. In addition to expanding the network of canals across the Glades, their plan called for a huge canal (later named the St. Lucie Canal, Figure 5) from eastern Lake Okeechobee heading east toward the Atlantic Ocean.

In spite of all the problems associated with Everglades reclamation up to this point, many people believed the St. Lucie Canal would bring relief. Isham Randolph offered a more candid expression of his opinion when he wrote former Governor William S.

Jennings on 2 March 1914 (William S. Jennings, personal and public papers). In Randolph's judgement, the salvation of the Everglades hung upon digging the large canal from Lake Okeechobee's eastern shore. "Without that canal, the efforts now being expended are a sheer waste of money and effort. Small canals tapping Lake Okeechobee and running southward not only fail to drain the Everglades{,} but actually aggravate conditions which they are supposed to remedy because they keep the lands wet with water taken out of the Lake." Randolph insisted that if funds ran low, all remaining money should be devoted to the large (St. Lucie) canal.

George E. Anderson of Chicago protested to Thomas Will on 22 November 1922 that continued flooding in the Glades explained his reluctance to move south and begin pioneering. Like many others, Anderson looked forward to the completion of the St. Lucie Canal. "The Okeelanta section will not be safe until the St. Lucie Canal is finished. It is possible to get away with some good crops some seasons, but you are always taking a chance."

As previously indicated, the North New River and Miami Canals had been completed by 1913. By 1921, the Hillsboro and West Palm Beach Canals were fully operational (Figure 5; Gleason 1984). Yet progress on the St. Lucie Canal lagged far behind. Begun in 1916, this canal would not be completed until 1924 (Gleason 1984). Moreover, shortly after completion of the St. Lucie Canal, it was rendered ineffective due to flooding in 1924. According to Marston et al. (1927 p.68), "water finally broke through the spoil banks in some twenty-five different places, washing large amounts of eroded material into the canal."

Dovell (1947) pointed out that the Randolph Commission limply called for progressive reclamation (as Meade, Hazen, and Metcalf had done), and then prepared a plan that would drain all of South Florida at once. Hanna and Hanna (1948 p.168) charitably suggested that if Randolph, Leighton, and Perkins had drafted a plan of slow and steady development, "certainly there would have been violent outcry had sections of land, already sold, been pushed into the hinterland of reclamation at some distant date."

Just before Randolph, Marshall, and Perkins issued their report in October 1913, Thomas Will's son Lawrence and four other men left Washington, D.C. for the Everglades. Five miles south of Lake Okeechobee, near the junction of the Bolles and North New River Canals, Will and the others began hacking the first settlement in the Glades proper--Okeelanta--out of the sawgrass (Figure 43). Lawrence later remembered being afraid that "the Glades would be all drained, developed and settled before I could get to see it in its natural virgin state" (Lawrence Will 1977 p.185).

R.H. Little (1938 p.41) arrived in Okeelanta in 1914: "here and there in the neighborhood could be seen a few shacks nestled in the saw grass and occupied by hardy pioneers who were striving to do their bit toward subduing this vast acreage of the Everglades." These people and others that followed soon after, discovered (as did Herman Walker) that practically nothing in the promotional literature was true. According to Lawrence Will (1968 p.228) "floods and freezes, wild hogs and coons, muck fires, gnats and mosquitoes, slow transportation and greedy New York buyers, all these discouraged many." After commenting on the frost in a letter to Lawrence Will on 15 March 1914, Thomas Will wrote his son the following week (22 March): "you are certainly having a

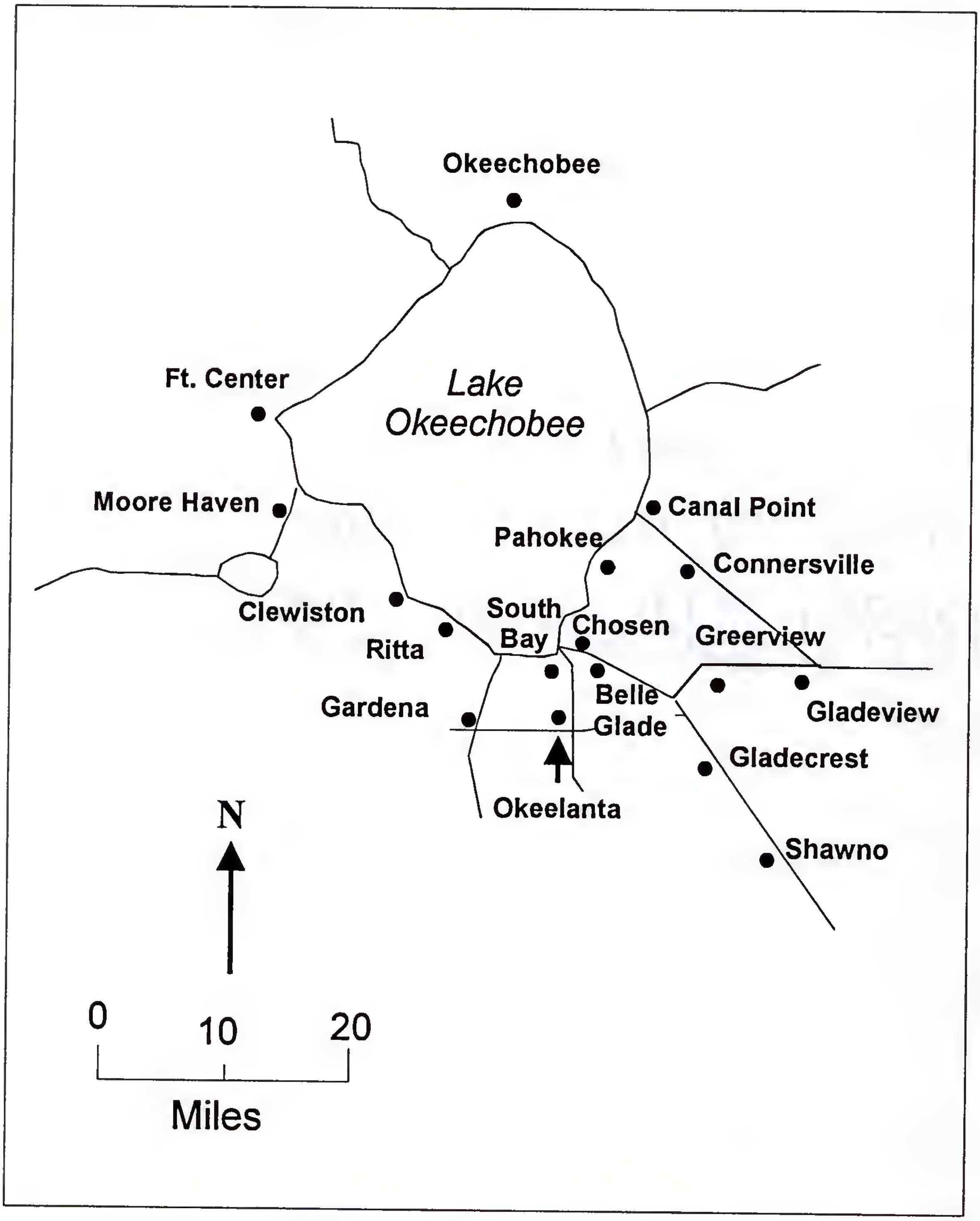

Figure 43. Historic towns of the Upper Everglades, many of which no longer exist.

time with the frost. I hope you are able to survive." Okeelanta's settlers were not the only ones experiencing problems. Writing from Davie on 1 June 1914, A.W. Potter and his wife expressed their displeasure to Thomas Will. "We have spent nearly three years here and have found that we are poorer than when we came. Mrs. Potter is discouraged and wants to get away. . . . We are both disgusted."

Soon after moving to Ft. Lauderdale in late 1914, it occurred to Thomas Will that winter vegetable farming was not as profitable as he previously believed. "So it's another freeze?" he asked his son on 14 January 1915. "We've got to cut out this winter trucking, save as a side issue." Still, the elder Will maintained his confidence in the land. After all, the USDA had been surveying soils along the North New River Canal (see Figure 5), and it was thought that the results of this work would enable farmers to make better use of their land.

During the opening months of 1915, soil scientists surveyed the area along the North New River Canal from Ft. Lauderdale to Lake Okeechobee (Baldwin et al.1915). They noticed that practically all of the lands suitable for trucking in the vicinity of Ft. Lauderdale were in use. Yet they found no permanent settlements west of Davie until they encountered the budding community of Okeelanta, about five miles south of Lake Okeechobee. One can imagine Thomas Will's expression as he read the following sentence on page 13 of their report: "throughout the vast reaches of the Everglades considerable work is required to prepare acres of Peat and Muck for planting crops." After noting that fertilizer was used on all commercial-scale fruit and vegetable farms in the region, and the severe frosts that winter, the soil scientists concluded that land prices could not possibly be based on the earning capacity of the land (p.14).

These were not the only disparaging remarks found in the report. Baldwin and his colleagues observed that only the soils beneath the narrow custard-apple band around Lake Okeechobee's south shore were extremely valuable for agriculture. Furthermore, "the drainage operations within recent years have so lowered the water table that in seasons of deficient rainfall the moisture supply is a serious problem" (p.32). As for the "brown fibrous peat" that occupied most of the Everglades, the soil scientists cited problems with similar soils in Ireland and northern Europe. "Peat soils everywhere have been found difficult to utilize for agriculture" (p.35). In their soil map (Figure 12), Baldwin et al. make quite clear that the soils near Davie were different from those throughout the Everglades. This was particularly troublesome for Glades boosters because they presumed, implied, suggested, hinted, and insinuated that Davie soils were the same as those in the sawgrass country. As if this were not bad enough, they found that in only 32% of the peat soils surveyed was the water table below the surface. The rest of the area was flooded to a maximum depth of 38 inches--and this was during the dry season!

Issued in July 1915, the report produced much consternation among Everglades boosters. Thomas Will indignantly wrote Florida's Commissioner of Agriculture, demanding to know whether or not there existed any difference between the soils at Davie and the rest of the Glades. Commissioner William A. McRae responded on 23 August 1915. "As to the difference in soils on the Davie lands and those on the Everglades south of the lake, there is very little if any difference. . . . There have been hundreds of analyses of the soils from every portion of the 'glades and there has been only the slightest deviation in chemical content." McRae insisted that "the soil you are on south of the lake {at Okeelanta} is equal to any in south Florida, no matter where they lie. . . ." As far as the commissioner was concerned, "the differences suggested by persons who make the claims you refer to, probably arise from local jealousies, and that is about all there is to it."

Writing from Washington, D.C. on 11 October 1915, Herman Walker asked Will what he thought of the soil survey. "From this, I would gather that the soil at Davie is considerably better than that in the Upper Glades." Will responded four days later, "the Soil Survey report was the biggest disappointment in a long time. The East coast people--representative people at that, not mere land sharks--are up in arms about it." John Newhouse (1932) noted that "protesting articles appeared in the newspapers; and the report was hushed and soon disappeared from circulation" (p.14). Indeed, Will later told Dovell (1942) that copies of the report in the Ft. Lauderdale area were gathered and burned in a public fire.

Will contended that the only differences in South Florida's organic soils were due to the degree of decay. Moreover, he believed that the report was manipulated by those interested in prosecuting land sellers for false advertising. "I am profoundly convinced of the vast possibilities of the Glades," Will insisted, "the proposition needs simply to be handled wisely." Walker agreed, writing Will on 6 November 1915. As before, he acknowledged that the Davie area had several different kinds of soil. Like Will, he explained those differences in terms of decay. "I am wholly of the opinion that the difference between the peat and the muck is entirely one of decomposition, which is hastened very greatly by cultivation so that it takes but a few years for the peat to become good muck." What nobody understood at the time was that soil decomposition would not cease in a few years. (Indeed, according to Pendleton et al. 1976, there is practically nothing left of the five-foot thick layer of organic soil that Walker farmed at Davie in 1912.) Displaying his distrust of science, Walker added that "it seems to me that the young men who made this survey were more scientific than practical."

By late 1915, however, even Thomas Will tempered his enthusiasm for the Glades. On 17 September 1915, he wrote prospective Everglades buyer C.A. Huff of Clayton, Michigan: "farming here is not the 'Cock-sure' thing we may have thought five or six years ago when we bought. That isn't saying the land isn't good. But during this initial period, when almost everything must be tried out, we must walk as on thin ice." Yet Will maintained his faith in the ultimate transformation of the Glades. "It is to the interest of all of us here that these lands shall be broken and cultivated, for we want to get this region out of the Jungle state and into the Garden-of Eden state as quickly as possible."

Two years after the state authorized the Everglades Drainage District to sell $6,000,000 worth of bonds to raise revenue to complete Everglades reclamation, none had been sold. In 1915, former Governor William S. Jennings prepared a report intended to encourage the sale of drainage district bonds (Jennings 1915). After outlining highlights of the reclamation effort to date, Jennings resurrected the Randolph Commission of two years prior. "These engineers are emphatic in their declaration of the feasibility, practicability and soundness of the drainage project, and strongly recommend that drainage be carried out" (p.21). Jennings then grappled with one of the problems in which prospective bond buyers were keenly interested. "The drainage of the Everglades has become a State policy and while not legally obligated, it is morally bound to the accomplishment of this great work" (p.23). Since Florida was not legally bound to repay any debts the drainage district might incur, and since reclamation had obviously not yet been accomplished, bond buyers shunned EDD bonds, fearing that the project might not succeed. Accordingly, Jennings strove valiantly to link the EDD with the credit of the state. "It may be further added that the State has no floating debt or unpaid outstanding obligations; that the State has never repudiated any bonds or obligations and therefore, is entitled on account of this splendid record and the management of her affairs, to consideration of the highest character" (p.24). Everglades reclamation limped along as Jennings's report produced only modest results. By early 1920, the EDD had managed to sell only $3.5 million of the authorized $6 million in bonds (Elliot 1929).

By 1916, it had become painfully clear that draining the Everglades would not be a quick, inexpensive, and uncomplicated matter. Agricultural results were mixed at best. On 4 July 1916, Thomas Will scolded Harold Bryant for publicly claiming that there was practically no drained land in the Everglades and that farming was not proving successful. "I admit that the % of properly drained land there is small." But Will argued that experimentation should continue. Besides, he asserted, "my son has been a Glades farmer for 32 months, and has never yet been drowned out, or seriously hindered by excessive water." Will concluded that the negative publicity must cease, adding "that simply kills the whole thing--and it's dead enough now, Heaven knows, with a lot of the old buyers."

Will knew that farming in the Glades was still experimental and he regularly beseeched Everglades buyers for contributions to support his effort. A few sent him a little money but most remained skeptical, either ignoring his requests, or responding as did

Albert W. Eastman of Orange, New Jersey, on 3 March 1917. "If I knew what resulted from the $96 I sent last and a little more certainly of your prospects, I would, of course, be in better shape to act." William Robertson of Miami gave Will a more extended response on 23 February 1917. "Maybe the others have some 'easy money' as you call it, but I work at hard labor for mine." Besides, Robertson just lost his job and wanted Will to sell his lot for him. "I cannot afford to have stock in a poor man's experimental station that always is calling for food, and no results; it is not what you said by a long shot."

Opinion on Florida's southeast coast was equally divided. Newspapers like the *Ft. Lauderdale Sentinel* and the *Palm Beach Post* regularly published Will's positive stories regarding Everglades development. Furthermore, the Ft. Lauderdale Board of Trade supported Senator Fletcher's efforts to obtain an agricultural experiment station for the Everglades (letter from the Board of Trade to Fletcher, 13 July 1917, Thomas Will, Personal and Public Papers). Finally, in 1915, a collection of small farmers, real estate promoters, and lower east coast Glades boosters, created the "Back to Broward" League (1916). Among other goals, the League tried to force politicians to accelerate Everglades reclamation. They asserted that Florida's honor was at stake and that the state had an obligation to ensure adequate reclamation.

On the other hand, many people along the lower east coast believed that Everglades reclamation was an unnecessary boondoggle. L.G. Biggers of the West Palm Beach Board of Trade made this point clear in a 22 May 1917 letter to Thomas Will: "there are, as you know, a number of Everglades knockers in this and other communities along the East coast." Will responded on 4 June, asking Biggers "how can a big, wealthy community sit by and wait for a handful of pioneers, who have almost exhausted their initial capital in 'learning the game,' to do alone the work that will make the aforesaid community rich and powerful?"

In 1919, Will wrote the USDA's Bureau of Plant Industry and received a response from C.V. Piper on 5 August. Piper admitted that there needed to be much more experimental work in the Glades to determine their potential accurately. "My own opinion," Piper contended, "after repeated visits to the Everglades and to other reclaimed muck areas, is that the bulk of the Everglades, particularly the brown fibrous peat soils, should be devoted primarily to pasture grasses and livestock." Piper realized that using the Glades for forage and livestock rather than high-priced vegetable crops would be a relatively unpopular idea. Yet he argued that part of the reason livestock would be the best thing for the Glades was because grass grew naturally in the region and maintaining a grass cover would reduce soil shrinkage. "Bear in mind that these brown fibrous peat soils consist of 85 per cent or more of vegetable matter, and this must be conserved, as otherwise there could be only one end to the constant shrinkage which goes on particularly on cultivated land." Apparently there were those who began to realize that organic soils would always subside if drained. Unfortunately, most Everglades boosters not only continued to ignore soil subsidence, they also continued to push for a return on their investment: and this meant finding a crop that would command a relatively high price.

John Newhouse (1932) recalled that 16 towns had been established in the Glades by the early 1920s (Figure 43). He added that "laying out townsites in the Everglades was quite a pastime in those days" (p.21). Yet the U.S. census for 1920 reveals that all of Dade County's precincts were centered along the Atlantic Coastal Ridge (U.S. Department of the Interior 1922). Of Broward County's 5,135 people, only 190 lived as far inland as Davie, eight miles from the coast on the edge of the Glades. Palm Beach County had 18,654 people but less than 2,200 of these lived in the Everglades. Moreover, almost all of those associated with the Glades lived on the shores of Lake Okeechobee.

The 1920 census divided the Glades into three precincts. Along Lake Okeechobee's south shore, Ritta had just 495 people; and Pahokee, along the lake's east shore at the northeastern edge of the Everglades, tallied 1,147 residents (Figure 43). Precinct boundaries were probably such that a handful of the people in these precincts actually lived away from the lake along the recently completed Miami, New River, and Hillsboro Canals (Figure 5). The third precinct, centered just five miles south of the lake at Okeelanta (Figure 43), had 596 people (U.S. Department of the Interior 1922).

Furthermore, throughout the first decade of settlement, the Everglades were a revolving door of humanity. Little (1938 p.34) observed that "very few of the original old timers in the Okeelanta community became permanent residents. As each year brought newcomers, old settlers would leave." He cited poor living conditions and relatively low wages as reasons most people left. After nearly a decade of promotion and pioneering, the Everglades remained relatively unsettled. Most of the original land buyers were content to admire the Great American Wetland from afar.

The Early 1920s: Years of Floods

As settlement in the Everglades entered its second decade, the region attracted increasing attention. Politicians and engineers in Tallahassee continued to dominate Everglades reclamation policy. Yet institutional, hydrologic, and ecological problems multiplied out of control and assumed a magnitude difficult to imagine. As a result, bitter controversy erupted between the declining number of people who supported the state's effort to drain the Glades, and a growing number of detractors. Pahokee resident J.F. Waters illustrated this point in a 24 January 1924 letter to B. Pickman Man (Thomas Will, Personal and Public Papers). "Our State officials know much less about our country below Lake Okeechobee than hundreds who have been here in the Everglades." Waters complained that Florida Governor Cary Hardee and Chief Engineer Fred C. Elliot recently traveled through the region, quickly and quietly. "And when they got back to Tallahassee," Waters asserted, "a long article, giving an account of their very lengthy trip, and that everything was wonderfully fine everywhere, with fine improvements as to roads were being made thru the Glades country. Farce pure and simple."

By the late 1910s, the Everglades had become noticeably drier due to the combined effects of drainage and a few years that received less rainfall than normal; consequently, muck fires became a more frequent occurrence across South Florida (Figure 44). Pioneer R.H. Little (1938 p.67) noted that "some people complained that the Glades were being so over-drained that their reclamation should be stopped." Numerous fires consumed much soil throughout the Glades during the 1920s, converting it into thick, acrid smelling smoke that occasionally blackened the noon day sun at Miami (Kelly 1931).

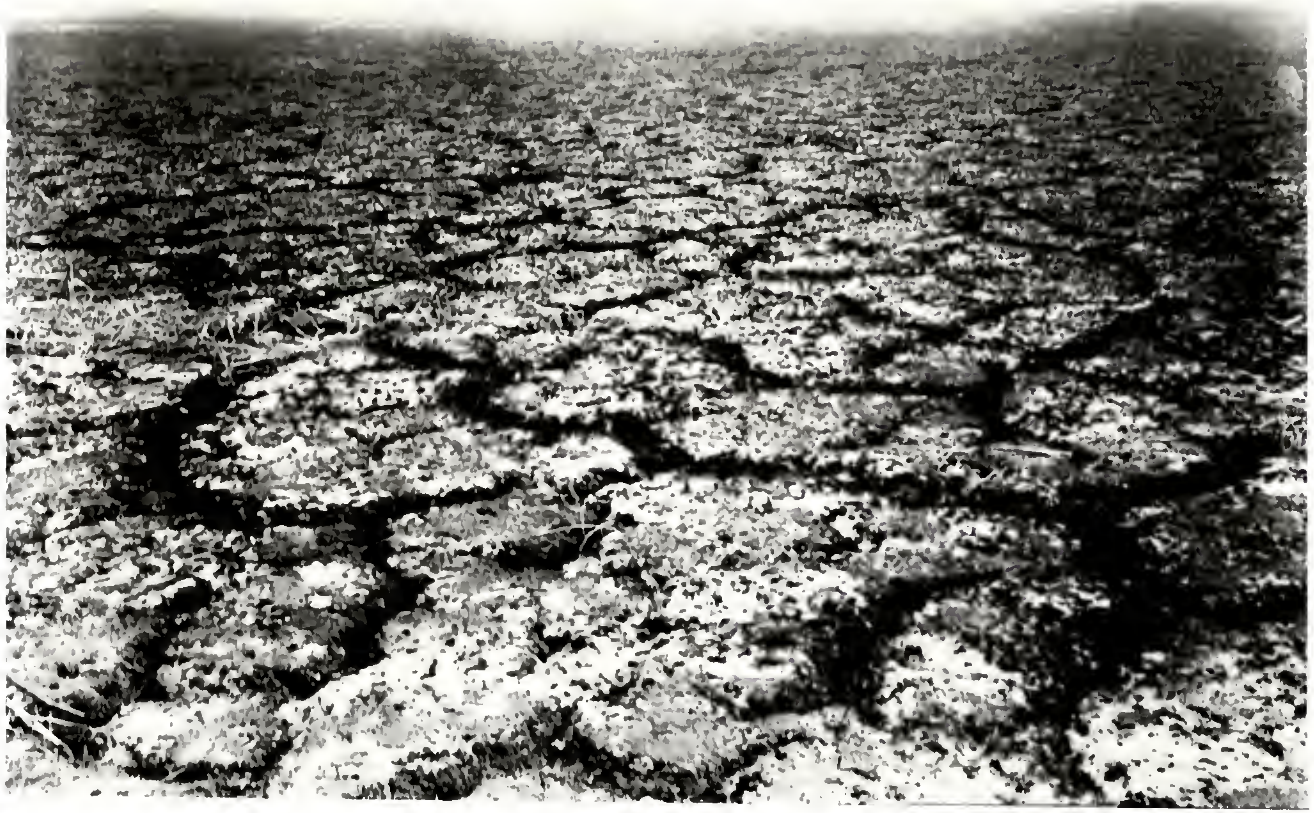

Figure 44. Photograph of dried organic soils in South Florida, March 1928.
Source: John K. Small photograph collection, Florida State Archives.

Muck fires are particularly difficult to extinguish because they frequently smolder underground long after flames have vanished from the surface.

Everglades buyer Alvin Whitney, a forestry professor from Syracuse University, expressed his indignation in a 28 September 1924 letter to Thomas Will. “I cannot imagine any worse calamity than the burning of the very soil. It seems to me that both County and State authorities must be criminally negligent, and their drainage development worse than a farce.” Whitney would rather see the Glades returned to their original condition and held strictly out of use. “For then at least its potential richness would be conserved for a more intelligent race to come after us.”

Everglades pioneers would have been fortunate if occasional muck fires were their only problem. The 1920s were further characterized by a series of extremely wet months and years that periodically produced devastating floods. Indeed, excessive rains during the summer and fall of 1920 forced Thomas Will to leave his home in Okeelanta, temporarily he thought (Dovell 1948). Still, others remained in the Glades and continued pioneering.

By 1922, settlers had mixed emotions about their lives in the Everglades. Florence Watson of Okeelanta wrote Thomas Will (then living in Ft. Lauderdale) on 14 March 1922. “We came up here, spring 1917, with a good working outfit, came here at your advice, when if we would have followed our own advice we would have avoided these hardships and handicaps that we have had and are still having.” Watson resented the isolation and apparent lack of social and business opportunity. “In fact, I’ve had to let two good business propositions go because I am tied to my land.” She added that her uncle could not handle the work much longer and that since the farm was in good shape, Watson hoped that Will could find a buyer for her family's property. Fellow settler Victor Roth wrote Will on 11 May 1922, noting the muck fires off in the distance: "it surely never has been so discouraging to us settlers as it is now."

Yet John Newhouse told Will on 13 April 1922 that "I feel very optimistic about conditions at Okeelanta." He commented on daily mail service, railroads reaching from Florida's west coast out to Clewiston (Figure 3), new telephone lines, and Okeelanta's active community council. "Last week I went to West Palm Beach in an auto, for the first time since I came into the Glades." Two weeks later, Newhouse told Will that after the lakeshore became crowded with development, growth would move south of the lake toward Okeelanta (letter to Will dated 28 April 1922).

A few months later, with the onset of the wet season, tremendous rains flooded the region once more. Although there is no precipitation record at Belle Glade for 1922, records from Ft. Lauderdale illustrate the problem (U.S. Department of Agriculture 1922). After receiving approximately 40 inches of rain from May through September 1922 (which is about 13 inches more than average for this four month period), Ft. Lauderdale received over 15 inches in October and over seven inches in November (almost double the average for these two months; see Figure 33). R.H. Little (1938) remembered that during one stretch at Okeelanta, flood waters remained from 21 September 1922 until 14 February 1923. Water was so deep, Little recalled, that one could easily drive a boat outside canal channels. In the mean time, his fruit trees were submerged and destroyed, and his starving livestock had to be moved to a small patch of higher ground nearby. Yet Little remained philosophical about the calamity. "We looked upon our flood experience as somewhat of an adventure. In fact, our coming to the Glades in the first place was considered as such" (p.92). Of course, Little could afford to hold such an opinion, admitting that he and his wife were not counting upon making a living from their land.

Florence Watson's uncle, Charles Price, wrote Will on 15 July 1922. "But how long, oh Lord, how long must our interest be jeopardized by plans that give no sign of being workable in five years!" Price complained that the strain of pioneering was better left to younger people. Half a year later, Price insisted that his family must move: "We--three of us--practically invalids from pioneering, last five years the worst, must have a change" (letter to Thomas Will dated 2 January 1923). Another pioneer, Ben Anjima, wrote Will on 3 November 1922. "If it wasn't for my son in Jacksonville I would starve. . . . There is no income. . . . We are going to leave the Everglades just as soon as we get the means." A couple of weeks later Anjima added that it looked to him as if it would be quite a while before the Glades amounted to anything. "This business of living in water six inches deep in the house don't go" (letter to Thomas Will, 15 November 1922). Indeed, flooding postponed construction of a government sponsored experiment station at Belle Glade until 1923.

Always the optimist, John Newhouse remained upbeat. "The flood has taken the courage out of the people," he wrote Thomas Will on 17 November 1922. "They will get over that, when things begin to look better, when they can plant a new crop they will take heart anew, but at the present they cannot be pushed." Newhouse and Will believed that the flood would prove a blessing in disguise, thinking that it would force the state to accelerate Everglades reclamation. Both men were sadly mistaken.

R.H. Little (1938 p.100) recalled that a hail storm wiped out many vegetables near Okeelanta during the spring of 1923. Then, heavy rains during May and June 1923 saturated the land, and in July their canal overflowed and destroyed crops that settlers planted since the hail storm. By 21 August 1925, long-time Glades pioneer Victor Roth told Thomas Will that he had had enough. "Since the land cannot be settled now, as you well know, under such conditions, kindly consider my tract on the market." After serious flooding in June 1926, even R.H. Little (1938 p.113) started to lose faith. "We began to realize that there was not much truth in statements, that were made after each flood, that that would be the last one because the St. Lucie Canal and our local drainage districts would prevent a recurrence of floods." Frost also continued to be a problem for Everglades farmers. Ruth Anjima wrote Thomas Will on 29 March 1926. "This spring three times our crops of beans were killed by frost. This has been a bad spring for everybody. No one can help that but it puts not a cent in our pockets and it is not pleasant." And all of these catastrophes occurred before the major hurricanes of 1926 and 1928.

It would be a mistake to assume that Everglades pioneers were a unified group, struggling together to improve their lot. Some settlers simply complained about the Glades generally. For example, John Newhouse wrote Thomas Will on 15 April 1923: "it makes one sick to sit amongst them and listen to the faultfinding with everything, without any constructive plans offered in place." Other times, settlers argued with each other about road routes, canal water levels, and the location of bridges over canals (among other things). Water depth in canals was a particularly contentious issue. Although relatively high water levels in canals greatly improved transportation, many farmers favored low canal water levels in order to have a margin of safety from flooding after a heavy rain. On 24 January 1922, Thomas Will complained to John Newhouse: "can it be that anyone in Okeelanta is so lost to all sense of public spirit and interest, as deliberately to attempt to prevent the saving of what is left of our canal transportation?" Finally, Okeelanta competed with over a dozen other Glades communities for settlers and infrastructure. Since the most successful Everglades settlements were located along the lakeshore, John Newhouse advised Thomas Will on 27 April 1926 against trying to carve an "Everglades County" from Palm Beach County. "The coast has been negligent," Newhouse argued, but "the Lake shore has been hostile."

With problems such as the pioneers faced, most lower east coast residents continued to "knock" the Everglades. Writing on 23 April 1924, Thomas Will complained to B.B. Tatum (a large Glades landowner), "I need not tell you how frightfully unpopular the Glades country is, save with a few. . . . People now think the Glades is the one thing to avoid." By this time, Florida's lower east coast had been divided into three counties: Dade, Broward, and Palm Beach (Figure 1; compare with Figure 39). Will tried to convince all three counties to build roads into the Glades. On 22 February 1925, he wrote his son Lawrence that "after a lot of experience with three Coast County seats, I am convinced that not one of them cares a tinker's anathema for the Glades."

Difficulties in the Glades did not hinder the real estate boom along Florida's southeast coast. Will observed that land values on the coast were "popping like corn on a stove." In a 4 March 1925 letter to his brother N.H. Will of Oklahoma, Thomas admitted his frustration: “the rage of speculation on this lower east coast is beyond the imagination of man to believe. It suggests rank insanity.” The land boom on Florida’s southeast coast had cooled somewhat by early 1926, but Will remained disgusted. To W.J. Wandrey of Wisconsin, Will complained on 13 February 1926: “the competition of the coast, which monopolizes the tourist traffic, has made it extremely difficult for the Everglade country to get even the crumbs that fall from the table of speculators who dominate this situation.”

There were, however, a handful of lower east coast residents during the early 1920s who remained interested in Everglades development. West Palm Beach attorney George G. Currie tried to soothe Will on 3 August 1920. He contended that it was not that coastal residents disliked the Glades, but that they were in the process of settling a frontier of their own--and that took substantial sums of money. “These people in some cases came here before you did and they have been paying taxes when things were even more cheerless than they are to you.” Currie admitted to Will that he favored publicly financed development in the Glades, even though he had a hard time paying his own property taxes. Besides, Currie asserted, “if you just had to go in there and raise a rumpus and get everything you wanted {from the county}, the credit and honor of being a pioneer would be too cheap.”

George F. Bensel, of the Southern States Land and Timber Company, wrote Will on 19 August 1924, admitting that there was still much work to be done in the Glades. “Sometimes I despair whether we old pioneers are going to last long enough to see complete fruition. . . . But when we compare present conditions with those existing twenty years ago, for instance, we after all have cause for congratulation.”

Finally, a Miami lawyer named J.P. Simmons agreed with Will that the lower east coast was making a great mistake by not building more roads in the Glades. In an 18 December 1923 letter to Thomas Will, Simmons revealed the source of his interest in the Glades. "We have invested in the Everglades west of Fort Lauderdale, many thousands of dollars, and Broward County would have been benefited very materially by these developments, even as of this early date, if it had not been impossible to reach the Glades by public highways." In other words, the lower east coast people most interested in Everglades development were those who stood to benefit the most.

Although John Newhouse mentioned riding in a car from the Glades to West Palm Beach for the first time during early 1922, Everglades roads during the 1920s were notoriously unreliable (Newhouse 1932; 13 April 1922 letter to Thomas Will, Thomas Will, Personal and Public Papers).All of them consisted of raised beds of muck which frequently washed away during floods or burned away during fires. Others were quickly overgrown with weeds. Travel across these roads after rain was difficult at best. Transportation along canals was even worse. Thomas Will hounded county governments for improved roads in the Glades throughout the 1920s, but he was cruelly disappointed. Road building requires tax revenue, and taxes in the Everglades during the "roaring twenties" became an issue of bitter dispute (Newhouse 1949).

John Newhouse wrote an essay in 1949, never published, entitled *Everglades Taxes.* The manuscript contains what the author describes as a "partial listing" of taxes paid on his ten acre tract in Okeelanta from 1913 to 1931. Newhouse added that his taxes were representative of what most paid per ten acres in the Glades; there were some differences. Without a doubt, one of these differences had to do with taxes assessed by the Everglades Drainage District (EDD). In 1907, every acre within the drainage district was taxed at the same rate. By 1913, it occurred to the District's Board of Commissioners (who doubled as the Trustees of Florida's Internal Improvement Fund), that different parts of the Glades received different benefits as a result of the District's drainage activities. Accordingly, they created different tax zones within the EDD: higher tax rates were assigned to zones thought to benefit more from drainage, while zones remote from canals (and drainage) would be taxed at lower rates. Even these crude zones were hopeless representations of the actual value of such lands.

In any event, Newhouse's tax chart has been reproduced as Table 1. The second column from the left is the valuation of Newhouse's ten acre tract; the next 12 columns represent taxes assessed from different taxing authorities; and the last column is the sum of all taxes listed for each year. This chart makes several points clear. To begin with, from 1913 to 1931, a plethora of taxing districts was created for a variety of purposes. In addition to state and county taxes, Everglades landowners paid taxes to several different drainage and flood control districts; inlet and inland navigation districts; road districts; a school district; and from 1925 to 1928, they paid taxes in a futile attempt at fire control. With such a chart, one can easily trace the chronological development of different taxing authorities (and the problems they were intended to solve).

Tracing Newhouse's Everglades drainage taxes is particularly revealing. Newhouse paid the Everglades Drainage District $1.50 per year from 1913 to 1918. Ironically, EDD taxes rose steadily during the 1920s, a period when most pioneers experienced devastating

Table 1. Taxes in the Everglades from 1913 to 1931.

	Valuation	*********************					Taxes					**************************	Annual
Year	of 10 acres	A	B	C	D	E	F	G	H	I	J	K	L	Total
1913	$30	.23	.83	.09	1.50									2.65
1914	$30	.17	.96	.09	1.50									2.72
1915	$20	.12	.80	.16	1.50									2.58
1916	$20	.13	.76	.16	1.50	.10								2.65
1917	$30	.27	1.35	.34	1.50	.15	.21							3.72
1918	$30	.24	1.26	.24	1.50	.15	.12							3.51
1919	$30	.36	1.41	.16	2.00	.15	.24	5.00						9.34
1920	$30	.33	1.38	.24	2.80	.21	.24	5.00						10.20
1921	$40	.43	1.84	.32	2.80	.28	.44	5.00	.16					11.27
1922	$40	.43	2.12	.32	3.50	.34	.44	5.00	.16	.08				12.39
1923	$40	.46	1.88	.60	4.00	.40	.52	5.00	.40	.04				13.30
1924	$40	.43	1.88	.60	8.20	.40	.40	5.00	.32	.04				17.27
1925	$80	.60	2.72	1.20	9.00	.80	.32	10.00	.56	.08				25.52
1926	$80	.60	3.44	1.20	9.00	1.04	.32	10.00	.64	.08	1.00			27.32
1927	$40	.30	1.96	.74	10.00	.88	.24	25.00	.32	.04	.60			40.08
1928	$40	.36	1.76	1.00	10.00	.80	.24	0.00	.32	.04	.60	.02		15.14
1929	$40	.57	1.28	1.12	7.00	.80	.20	20.00	.20	.04	.00	.04	2.50	43.75
1930	$40	.56	.48	1.36	7.00	.92	.04	25.00	.08	.04	.00	.04	2.50	38.02
1931	$40	.20	1.00	1.40	6.50	.89	.11	30.00	.20	.04	.00	.06	4.00	44.40

A=State
B=County
C=School District #4
D=Everglades Drainage District
E=Coastal Inlet
F=Road District #6
G=South Florida Conservancy District (a drainage district within EDD)
H=Road District #11
I=Everglades 1 mill tax
J=Fire Warden
K=Florida Inland Navigation
L=Okeechobee Flood Control District

Source: adapted from Newhouse (1952)

floods on a periodic basis. By 1928, Newhouse paid $10 in EDD taxes. Worse yet, Newhouse began paying local drainage district taxes in 1919. These escalated from $5 in 1919 to $30 in 1931. Finally, after hurricanes in 1926 and 1928, Newhouse began paying taxes to the Okeechobee Flood Control District. In spite of all these taxes, hydrologic problems remained unsolved.

Road taxes were equally unlikely to yield results. Newhouse recalled that Palm Beach County agreed to build a road from West Palm Beach into the Everglades during the 1910s. For one thing, labor scarcity forced wages up well beyond original estimates. Moreover, engineers initially chose not to build alongside the West Palm Beach Canal, where dredging machines were dumping potential road bed material. Instead they chose to build the road away from any canals and through (rather than around) the Loxahatchee Slough (much of which is now Water Conservation Area 1; Figure 2). Palm Beach County ran out of money for the road by 1917, and the project had to be abandoned. In a 31 July 1920 letter to West Palm Beach attorney George C. Currie, Thomas Will condemned Palm Beach County Commissioners. "We have been promised and promised, and taxed and taxed, and now, at last, we find our road money HAS GONE--largely into the Lox slough, and the proposition must be refinanced."

It is not difficult to imagine the impact that additional taxing districts had on Newhouse's total annual tax bill; his taxes increased from just $2.65 in 1913, to $44.40 in 1931. Former Governor Napoleon B. Broward insisted that state taxes would be reduced if the Glades were opened to settlement. Yet practically all taxes increased between 1913 and 1931. Indeed, John Newhouse's taxes escalated to the point that, during four out of five years from 1927 to 1931, annual taxes approached or exceeded the valuation of his property! South Florida's rapid development, particularly during the land boom of the 1920s, led to demands for infrastructure along the coast. New roads, schools, sewers, and other improvements were funded largely through bond issues, and ultimately paid for by raising taxes. According to Newhouse (1949 p.6), "then the real estate boom busted, and the banks busted with it, and the millions for road and inlet improvement were lost."

Thomas Will's correspondence with out-of-state Everglades landowners reveals much diversity of opinion. Property taxes on land that failed to rise in value rankled many investors. Lucy C. Kellerhouse of California bitterly complained to Will on 3 March 1926. "My tract has been no end of trouble to me, having been sold for drainage taxes in 1920." Eventually repurchasing her land, Kellerhouse joined many investors who were bewildered by the array of taxing districts outlined by John Newhouse. "I can not quite understand how many systems of drainage payments I am to keep up. I want to know if this land is worth holding and constantly paying out on."

Thomas Will never understood why most northern Everglades landowners refused to quit their jobs and move to South Florida to help him settle the Glades. During the middle 1920s, Will tried to entice landowners into pioneering by producing and distributing a pamphlet asking them to settle or sell. Syracuse University professor Alvin Whitney explained the perspective of most out-of-state landowners to Will in a letter dated 2 December 1925. "Like the rest of the absentees, who cannot leave their present occupations and so cut off their source of income to go pioneering, we cannot bring ourselves to give up and sell for a pittance." He agreed with Will that it would have been foolish to move to the Glades years ago and endure the hardships of beginning a settlement. Yet Whitney argued that in light of the ongoing disasters in the Glades, it would be equally foolish to attempt pioneering at this time.

Not all northerners shunned the Glades. Washington, D.C. resident Mary M. Childs asked Will about the cost of building a house at Okeelanta on 29 December 1922. “I am very eager to get a chance and dig and delve in the earth and make things grow. Also, I am eager to have a little home of my own, for the next half-century, a thing I have not yet enjoyed.” Others openly expressed their ignorance of conditions in the Everglades. John Thorne of Olathe, Kansas, wrote T.N. Creveling of Ft. Lauderdale on 22 May 1922 (Thomas Will, Personal and Public Papers), asking “are people living on land south of the lake, and have towns been built south of the lake, and if so, how far south of the lake has the surface water been taken off the land, so that it would be safe to try to live on the land?” Thorne had property 12 miles south of the Lake and wanted to know the prospects for settlement. Finally, on 10 July 1922, Fannie E. Deuser of St. Joeseph, Missouri wrote Thomas Will. Although she supported Will in his efforts to make the Glades agriculturally productive, Deuser claimed that people in her home town laughed at her for investing in Florida land.

During the middle 1920s, the New England based Brown Company began commercial farming in the Glades, and Will occasionally corresponded with the company’s John C. Sherman. It was during this time that Will toyed with the idea of creating a new county in the heart of the Glades. Sherman understood Will’s frustration with paying road taxes which resulted in relatively few roads in the Glades. Yet he counseled against splitting with the coast. "If the property along the coast does not take part in the future drainage bonds and assessments, then the drainage of the Everglades cannot be completed."

Not only did the Everglades Drainage District have great difficulty selling its bonds, banks were leery of loaning money to people in the Glades. On 10 July 1922, St. Joseph Missouri resident Fannie Deuser told Thomas Will that she approached a bank for a loan in 1919 (before the severe flooding began), offering her land in the Glades as collateral. The bank rejected Deuser's loan application because "there is not a bank nor anyone else in St. Joseph that will let money go on the strength of Florida land." Will discovered the same thing when he tried to borrow money in the early 1920s. In a 25 January 1921 letter to Charles G. Rhodes of Ft. Lauderdale, Will expressed his frustration with the financial community. "I applied not long ago to the Bank for a little money, and received a flat turn-down." He added that "there seems to be a bank boycott on the Everglades."

After complaining to Senator Fletcher that banks refused to make loans to Everglades farmers, the Senator patiently responded to Will in a letter dated 11 December 1922. "You have been flooded twice in two years, you are about to lose your holdings, although you have been diligent and capable, and if anybody knows how to make a success in the Glades, you do. In the face of those facts, can you blame them for hesitating about making loans there?" Senator Fletcher's response suggests that most people in the financial community had little faith in the Glades. Confidently asserting his belief in the St. Lucie Canal, Fletcher concluded that "until you have your drainage systems so you can fight these calamities every two to three years, it seems to me you will have hard work convincing them that such a loan would be safe."

Everglades champion Marjory Stoneman Douglas (1987) confessed that she thought little about the Glades until she began the research for her famous book, *Everglades: River of Grass* (1947). There was, however, a small but vocal handful of people dedicated to Everglades preservation in the early 20th century. For example, Vance (1985) ably describes the struggle of May Mann Jennings and other South Florida women as they fought to establish Royal Palm State Park in the Everglades by 1916.

Naturalists discussed their impressions of the Everglades after nearly a decade of settlement (Small 1918; Simpson 1920). One such naturalist was John Kunkell Small, curator of the museum and herbararium of the New York Botanical Garden. Small made several trips through the Everglades during the early 20th century. Among the many published accounts of his trips is an article that appeared in the *American Museum Journal* in late 1918. In this piece, Small reflects the tension between economic growth and environmental preservation in South Florida. "Wonderful changes have taken place in southern Florida within the last decade or two. Previous to that time anything in the way of modern transportation was wanting" (p.685). Small also commented on tremendous crops grown on Lake Okeechobee's southern shore. A few pages later, however, he remarked that "the natural features of the region are duplicated nowhere else, and unfortunately they are fast being destroyed" (p.691). Small concluded that it would take little effort to preserve significant chunks of South Florida's natural beauty if public officials had the proper interest in such matters. Unfortunately, they did not.

Charles Torrey Simpson (1920) moved to Florida's lower east coast in 1902, and nearly two decades later, it occurred to him that some record of the region's natural history ought to be assembled. He noticed vegetation changes and attributed them to drainage. "Where formerly the eye swept over a monotonous even expanse of saw grass, the view now presents patches on incipient forests" (p.126). Simpson also lamented the apparent destruction of bird life in the region. Despite referring to the Glades as a waste several times, he questioned the introduction of humanity into the Glades. "I sometimes wonder quite seriously if the world is any better off because we have destroyed the wilds and filled the land with countless human beings" (p.141). After noting many other changes, Simpson (p.231) offered the following summary of people and their behavior: "the human is a greedy creature of abundant and costly needs and he destroys, often wantonly, that which nature has so generously provided. . . . He exhausts the soil and then abandons it; he is a destroyer, not a conserver."

Authors of travel literature continued to include chapters on the Everglades. Some are little more than promotional material; others were written by people who knew nothing about the Glades and simply paraphrased 20-year old reports of the region; others offered a sober judgement of the region's prospects. Even if these books reflect only the author's opinion, however, they continue to demonstrate the mixed views of the Everglades.

Johnson (1918) began his description of the Glades thus: "there is a compelling charm about the unknown, and in the Everglades that charm is still potent. They have always been a region of mystery" (p.161). While there is little argument with this statement, the region’s mystery was becoming rapidly unfolded. Johnson displayed his ignorance (and perhaps that of others) of the region's hydrology. “Rains furnish only a small percentage of the clear, limpid, and palatable water, and the springs account for the rest” (p.162). Wisely choosing to refrain from commenting on the results of reclamation up to that point, he added only that “there is undoubtedly much agricultural value in the rich deposit of mud” (p.168).

Nevin Winter also wrote a Florida travel guide in 1918 which included a section on the Everglades. Although he too obviously paraphrased earlier writers, Winter struggled to characterize the area. Although it would be several more decades before the term “wetland” appeared (Moss 1980), Winter revealed the evolving understanding of these unusual environments. “The region is not exactly land, and it is not exactly water” (p.297). After reviewing the events leading to the reclamation project, he adds that “there are many complaints about the slow progress of the work from the purchasers of the lands, and there is probably good reason for it” (p.308). In conclusion, however, Winter expressed his faith that reclamation will eventually open millions of acres of fertile land for agriculture.

As a result of the Florida land boom during the middle 1920s, several writers attempted to capitalize on renewed interest in the state. Dunbaugh (1925) included very little material on the Glades, limply concluding that “the day may soon come when the Everglades will be known only to history” (p.32). Fox (1925) made his optimism in the drainage scheme quite clear. In addition to beef, dairy, and hog operations in the Everglades, “add to all this the absolute fact that wherever the land has been drained and farming operations have been launched, crops to astonish the northern farmer have been produced" (p.93). Most of the remainder of his treatment of the Glades consisted of paraphrasing and quoting from Fred Elliot.

Ralph Barbour (1926) admits that when he was a young boy, the Everglades were shrouded in mystery. In his mind, they were a "vast, dense, Amazonian jungle filled with mammoth trees and giant ferns and tropical beasts, birds and blossoms" (p.166). After visiting the region, however, he discovered that the Glades were not nearly as romantic as previously imagined. It seems fair to conclude that Barbour was not alone in that discovery. He eventually treats the drainage issue: "the project was a huge one, unforseen difficulties were met and the work slowed up" (p.177). Barbour then added a statement which appears to be supported by evidence previously covered. "The Florida public, outside of a small number of landowners to whom the draining of the Everglades meant financial salvation, became apathetic. The whole project began to take on the semblance of a vision" (p.177).

Stockbridge and Perry (1926 p.224) began their description of the Everglades by suggesting that "few who have attempted to visualize this region, and have afterwards seen it, have not changed their preconceived impressions." Although they did not go into detail, they appeared to argue (as did Barbour) that in the absence of information, youthful imaginations created mental images of the Glades that had to be revised after visiting the region. After acknowledging set-backs and obstacles, these authors expressed their absolute confidence in Everglades reclamation. "Here is where the greatest miracles are being worked" (p.238)..

If the 1910s provided enough challenges and hardships to cause people to reflect as they recovered from "Everglades Fever," the first half of the 1920s were so loaded with calamities that even die-hard supporters of Everglades reclamation questioned the project. Pioneers were just as likely to wade across flooded fields as to inhale heavy black smoke from nearby muck fires; the financial community grew increasingly mistrustful of sinking money into South Florida's swamplands; northern investors grew weary of mounting taxes; and residents of Florida's lower east coast had problems of their own as they struggled to cope with explosive growth along the Atlantic Coastal Ridge. People questioned Everglades reclamation not because of a budding concern for the environment--for they still believed in draining wetlands. They accused the State of Florida of mismanaging the drainage project. Surely the Glades were drainable.

The Late 1920s: Years of Tragedy

From 1920 to 1926, Everglades development proceeded at a snail's pace. Although a few reliable roads and railroads finally penetrated inland South Florida, reclamation was far from complete. Alternating years of flooding and drought plagued most settlers; most canals became choked with water hyacinths and rendered useless for transportation or drainage (Figure 45); and those with money to loan became increasingly skeptical of investing in the Glades. But if those interested in Everglades development thought that the worst had passed, they were sadly mistaken. Major hurricanes in 1926 and 1928 killed nearly 2,200 people near Lake Okeechobee and caused untold property damage. Drainage work slowed significantly due to lack of funds. Discontent with Everglades reclamation mounted in all quarters. Even those who thought they could profit from draining the Glades tempered their optimism. This section reviews people's perceptions of the Glades from 1926 to 1930.

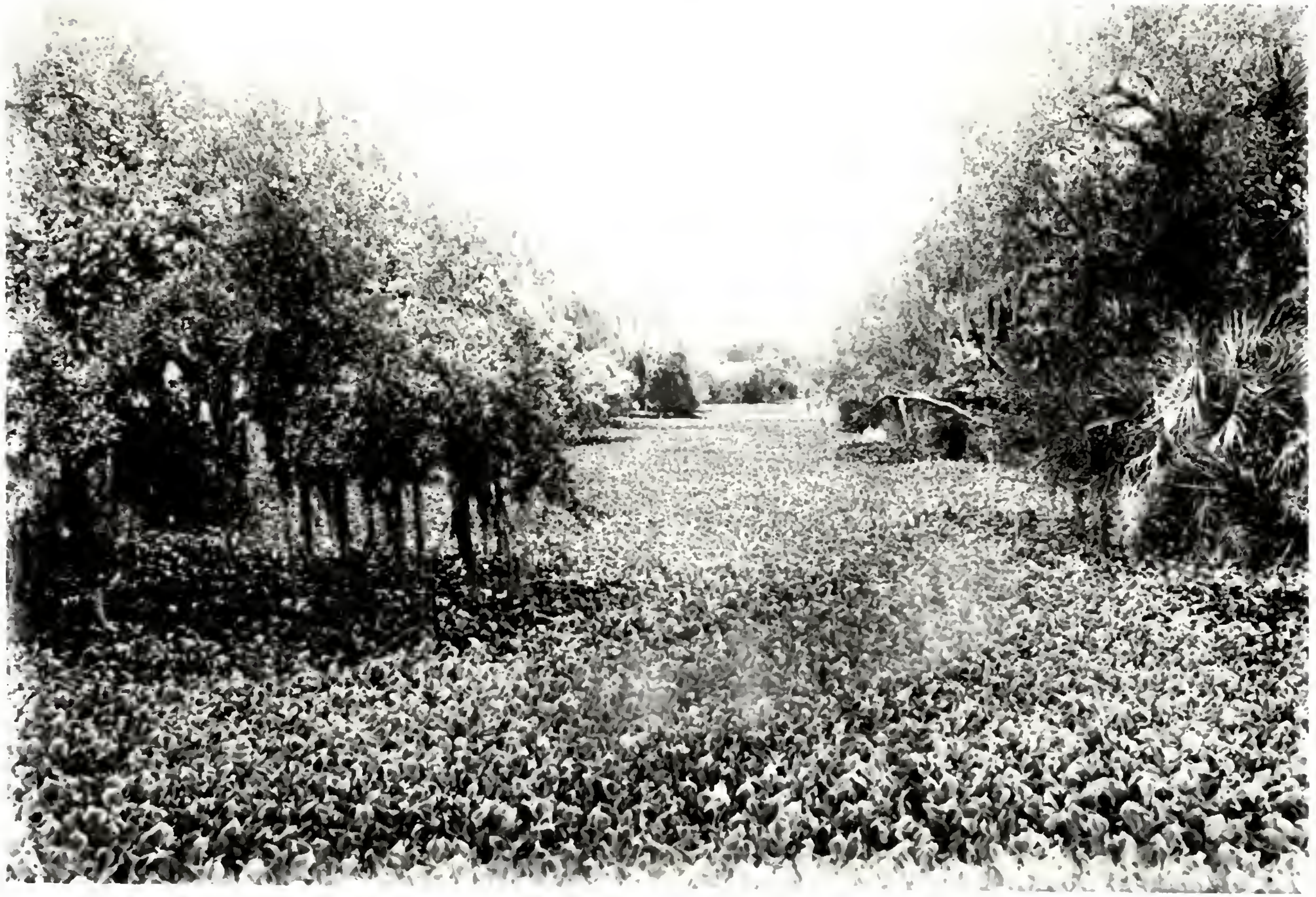

Figure 45. Photograph of water hyacinth-choked tributary of the Caloosahatchee River, ca. 1925.
Source: John K. Small photograph collection, Florida State Archives.

Between 1923 and 1925, the Everglades Drainage District erected a small dike along Lake Okeechobee's south shore in an effort to protect lake shore farmers from flooding during times of high water. This muck and sand structure stood just five to eight feet above the ground and was only 40 feet thick at the base. Lawrence Will (1964 p.297) helped build the dike and recalled that "it was never intended to stand the lake's waves in a hurricane." He incorrectly added (p.297) that "no hurricane had hit this state since 1910 and maybe never would again, so nobody gave it much thought." Apparently hurricanes that struck northwest Florida in 1915 and again in 1917, the 1921 hurricane that claimed six lives near Tampa, and the 1919 storm that killed 300 people at Key West were not close enough to matter (Doehring et al. 1993; Neumann et al. 1987; Slugg et al. 1971).

As pioneer R.H. Little (1938 p.119) prepared to visit friends and family up north during July 1926, the canal in front of his property was nearly full. A few days later, heavy rains flooded the Glades again. Then, on 18 September, disaster struck. A major hurricane crossed South Florida, killing at least 243 people (most near Moore Haven), destroying houses and other buildings throughout the Everglades and lower east coast. In addition, the storm added more flood water to the region, dropping 7.46 inches of precipitation at Belle Glade (U.S. Department of Agriculture 1926).

Pioneer Ruth Anjima wrote Thomas Will nearly a week after the storm (24 September 1926): "there is not a house in town {Okeelanta} that is not damaged." Anjima wanted to stay in the Glades but confessed that the struggle was becoming too much. "This is a wonderful place to live. I like it here but not the way it is now. . . . We will go out pretty soon for we cannot live here all our lives in two and three feet of water." Victor Roth, a settler who had endured the region's hardships since 1917, complained to Will on

12 October. “The actual settler, the pioneer, the ‘man with the hoe’ is of no consideration in a state with hundreds of square miles still to be brought under cultivation. I have lost all faith in the officialdom of the state and country.”

By early 1927, most of the wreckage had been cleared from the landscape and flood waters were finally gone. Yet despite the fact that 1927 provided relief from flooding and violent storms, remaining settlers found little to smile about. Nora Griggs wrote Thomas Will from Okeelanta on 8 February 1927: “I am surely worried for this coming year, everything is so dull.” Although Griggs later wrote Will (on 18 May) that a few new pioneers had moved to the sawgrass country below the lake, Okeelanta’s Sam Cooper told Will on 14 August that there was “not a thing doing, no new people coming in.”

The 1926 hurricane also caused considerable damage to Florida’s lower east coast. This led even more South Floridians to ignore the Everglades as they took care of immediate problems. This did not set well with Thomas Will. He continued to resent southeast Florida for its apparent lack of interest in its own hinterland. Everglades sympathizer George Bensel of the Palm Beach Chamber of Commerce wrote Will on 22 November 1926. “I hope you won’t be too hard on the people of West Palm Beach, because of their seeming neglect of the Everglades settlers at this time. . . . Many of the men who have influence here and are in a position to help, are tied up with their own problems, some of them very serious.” Bensel still believed that the Glades would eventually be developed, but he warned Will, “a sore which has been festering for twenty years, cannot be cured in twenty days.”

As a result of the 1926 hurricane, Everglades fortunes sunk even lower than they had during the flood and fire prone years of the early 1920s. Although Florida's Governor John W. Martin took a personal interest in Everglades reclamation, there was considerable protest. Martin addressed the drainage problem in a speech at West Palm Beach on 28 October 1926 (Martin 1926). This speech is important not only because Martin revealed his thinking on the Glades, but also because he acknowledged significant public dissatisfaction with the project.

Martin confessed that Everglades reclamation had become a "gigantic problem" but expressed his belief in the project: "it is the ultimate drainage of the Everglades that we are here to consider" (p.3). The Governor insisted that the Glades could be drained, agreeing with the Randolph Commission's report of 1913 which called for (among other things) the St. Lucie Canal, which remained badly damaged. "Unless something miraculous or abnormal takes place {like another hurricane?}," Martin proclaimed, "this canal will reduce the waters in the Lake so that when the next rainy season comes the Lake basin will be so low that the Lake can take care of the surplus waters pouring in" (p.17).

The Governor noted that the reclamation effort suffered from a chronic lack of funding, and that the entire project was a mess. "Now we stand in this condition, with this great problem confronting us with no funds to carry it on, in debt to every source from which we would borrow money, {and} without a market to sell bonds in. . . ." Martin complained that tax collectors in Dade, Broward, and Palm Beach counties assessed property in the Everglades Drainage District at just $15 million--a figure Martin considered far too low. Since the district owed nearly $11 million to existing bondholders, nobody wanted to buy any more EDD bonds because current tax revenues were being used to pay the existing debt.

Like most people who still believed the Glades should be transformed into farmland, Governor Martin found excuses for almost every problem in the Everglades. He blamed the transportation-oriented U.S. Army Corps of Engineers for rules and requirements regarding lake level control, "some of which were impossible to comply with if the drainage were to proceed" (p.5). Then, without mentioning any names, Martin implicitly blamed James Wright for the faulty drainage design. "Everyone knows that water will run down hill, but there are differences in hills" (p.15). Although Martin maintained his faith in the Randolph Commission's report of 1913, he correctly argued that Randolph's failure to account for soil subsidence substantially reduced the capacity of existing canals. Even God was called in for His share of blame. Referring to the previous month's hurricane, Martin declared that "God sent the rain and the storm and the Board had not sufficient funds with which to finish this {St. Lucie} canal in time to head off the storm and the rain" (p.18).

"I have received hundreds of protests from people that the land was burning up," Martin argued, "and I have also received hundreds of protests that the land was deluged with water, and many other and sundry complaints too numerous to mention and which would take me an indefinite period of time to enumerate" (p.20). Apparently some people wanted dikes while others threatened certain action if dikes were built. As indicated earlier, some wanted canals open and full of water while others wanted them closed. And everybody wanted dredges working in their neighborhoods. One person even suggested digging a tunnel from the bottom of Lake Okeechobee to the Atlantic Ocean! Martin concluded his speech by urging all of South Florida to support reclamation. Yet the Governor also tried to wash his hands of the matter by claiming that if reclamation failed, the responsibility would not be his (p.27).

Thomas Will was prone to think that he was the only man actively seeking Everglades development. Like a chief executive living in exile, he pleaded his case on Ft. Lauderdale's street corners to any one who would listen (Dovell 1948). Howard Sharp of Canal Point (Figure 3) was also intensely interested in helping develop the Glades. During the 1920s, he founded a newspaper entitled *Everglades News* and he served as the Glades representative to the Palm Beach County Board of Commissioners. Evidently, Will lectured Sharp in early 1927 concerning his responsibilities as an Everglades booster. An exasperated Sharp asked Will (in a letter dated 28 January 1927) "what do you expect me to do about Okeelanta?" Equally frustrated with the slow rate of "progress" in the Glades, Sharp scolded Will. "I've known of Okeelanta's situation ever since I came to the country. Don't act as if I had to be instructed as to my duties or informed as to conditions. Don't talk to me like you are in the habit of talking to people on the coast."

Meanwhile, it had become clear to newspaper editors on the lower east coast that Thomas Will frequently confused his beliefs about the Glades with the facts. Will's glowing opinion of the Glades' potential collided with the growing realization that Everglades reclamation would be an expensive endeavor. A decade earlier, his Everglades articles routinely appeared in South Florida's newspapers. Yet in a 25 June 1927 letter to Senator Fletcher, Will complained that "I am studiously shut out of the papers that should welcome the facts." Moreover, in a 1 July 1927 letter to the Senator, Will expressed his fear that people appeared willing to give up on Everglades development. "It has been publicly threatened again and again in recent months that the reclamation work might be abandoned wholly."

Governor Martin (1927) introduced his $20 million bond proposal to the Miami Chamber of Commerce in January 1927. He called upon the Florida legislature to authorize the Everglades Drainage District to sell $20 million bonds in order to complete the project. Martin had clearly become sensitive to criticism over the failure of Everglades drainage. "I did not begin the drainage of the Glades," the Governor declared, "or have any voice in the conduct of its affairs prior to this time" {referring to his inauguration in January 1925}. Martin claimed that it was his "desire to see the Everglades properly financed and put under way, that it may ultimately be cultivated and made into the most productive region on earth" (p.7). The 1927 legislature eventually authorized a $20 million bond issue for the Everglades.

How did Martin intend to sell $20 million in bonds when financial institutions refused to purchase the remaining $3.5 million worth of bonds previously authorized? Authorizing additional bond sales meant nothing if the only collateral offered was the dwindling tax revenue generated by the EDD. At a conference on Everglades reclamation in Baltimore during July 1927, Martin explained the 1927 bond legislation. He understood that EDD bonds were a poor security compared to state or municipal bonds. The Governor contended that "we have so many bonds issued on the Everglades already that the bond houses could not sell any more bonds unless they could say to their purchasers, not only have we a drainage tax by which we can collect enough money to pay the interest and sinking fund, but we have an additional tax, an ad valorem tax to back up payment of the bonds" (as quoted in Warfield 1927, p.49). There was no necessity for the additional tax, Martin insisted, it was simply a matter of helping dispose of the bonds. Yet the 1927 bond legislation also included a proviso stating that Florida's legislature MAY use general tax revenue to guarantee bond payments if taxes collected were insufficient.

Indeed, everybody at the Baltimore conference favored Everglades reclamation. The conference had originally been intended to iron out differences with objectors to Everglades drainage. Yet the objectors failed to attend and, as a result, the meeting's minutes reflect the attitude of all who probably stood to profit the most from Everglades drainage. For example, Florida State Senator A.W. Wagg (from West Palm Beach) admitted that "there are definitely men who do not want the Everglades drained" (as quoted in Warfield 1927, p.33). Yet Wagg maintained that Florida had a moral obligation to continue the drainage project. Seaboard Coast Line President S. Davies Warfield (p.36) announced that "I have not yet heard one real plausible cause of objection" to Everglades drainage. Ft. Lauderdale banker W.C. Kyle asserted that "I think it would be a disgrace to any citizen of the Everglades to say that the whole project should be abandoned" (as quoted in Warfield 1927, p.41-42). O.B. Brown, whose company owned several thousand acres in the Glades, wondered aloud: "I cannot understand for a minute how there can be any opposition from any quarter whatever or from anybody who is interested in the welfare of Florida" (as quoted in Warfield 1927, p.86). Finally, in that spirit of self-congratulation so typical of the conference, real estate man H.O. Sebring declared that "you have enough brains and energy at this meeting to go out and move the world" (as quoted in Warfield 1927, p. 87).

After the 1927 legislature authorized the $20 million bond issue, 28 Dade County residents prepared a pamphlet in which they listed their objections to the new bond authorization (Taxpayers 1927). To begin with, although property in the new town of Coral Gables as well as land west of 27th avenue in Miami was technically part of the EDD, this property had been exempt from drainage district taxes. The $20 million bond authorization included a provision which ended this exemption. These Dade County residents argued that this property would be taxed without any corresponding benefit. Unfortunately they overstated their case by claiming that "it is a matter of general knowledge that no water from the Everglades finds its way over the rock ridge which separates the high lands from the Everglades" (p.5). They maintained that Everglades drainage did not benefit them, so they should not be required to pay taxes to support the work. Furthermore, they strenuously objected to the provision which allowed the legislature to assume financial responsibility for paying off the bonds if need be. Several other objections were raised and the angry residents concluded that "never in the history of Florida has there been offered for sale a bond with the security that these bonds will have" (p.23).

Disagreement over the authorized bonds prevented their sale, and this only reinforced the attitude of those with money to invest. For example, most Everglades farmers found it difficult to obtain loans for their operations, even from programs sponsored by the federal government. This was because farmers were first required to obtain crop insurance which was prohibitively expensive for Glades farmers. Also, West Palm Beach realtor Jules M. Burguiers wrote Thomas Will on 5 January 1928 regarding the status of sub-drainage districts within the EDD. "The default of the Lake Worth Drainage District bonds had cast a damper over the market." Burguieres added that "certain bankers interested in drainage bonds have stated that they would not touch any sub-drainage district bonds until the *parent* issue was acted upon" (italics mine).

Will continued to hope that money for Everglades development could be found. He must have been disappointed to receive a letter dated 16 January 1928 from his friend George Bensel of the West Palm Beach Chamber of Commerce. "I wish I could write you something encouraging regarding . . . finances for Everglades development, but I must be honest and tell you that I do not know where funds for this purpose might be obtained at this particular time." Bensel observed that local banks were hard pressed to meet the demand for money on the coast, let alone the Everglades. As for outside sources of capital, Bensel was equally discouraged. "With all of the money idle in New York and other financial centers," he began, "it does look as though some of that could be employed with absolute safety in well selected agricultural loans but because of the uncertain drainage conditions and the difficulties we had in the past, these people are extremely timid."

Absentee landowners in the Everglades continued to ask Will if it was worth the trouble and expense of paying taxes on their land. Congressman Addison Smith of Idaho wrote Will on 16 November 1927: "I am anxious to learn what you think of the future of the Everglades, and if I should keep up my taxes on my holdings . . . or let them go, as many others are doing." Adelaide Smith of Palisades Park, New Jersey, also wrote Will (1 March 1928). She and her husband bought 10 acres in Okeelanta back in 1911. Taxes were low at first, she recalled, but they had risen to nearly $50 in 1927, "and still the land is apparently as worthless as when we bought it." Moreover, since the recent death of her husband, she claimed that "I am not in a position to continue to pay an ever increasing tax without any hope of ever getting any return." Although Mrs. Smith had never been to Florida, she had heard that conditions all over the state were "dead" in the aftermath of the land boom.

Meanwhile, before the $20 million bond issue for the Everglades had been approved, the State of Florida hired another trio of engineers to investigate the Glades. The Everglades Engineering Board of Review consisted of Anson Marston, S.H. McCrory, and George B. Hills (1927) , and they completed their report in May 1927. They found that the EDD had not deviated much from the Randolph Commission's suggestions, nor should they have. Furthermore, the Board of Review believed that "the engineering work has been carried out competently, efficiently, and economically" (p.52). This statement must have come as a shock to anyone familiar with the reclamation effort up to that point! The Board of Review admitted that soil subsidence was the source of many problems and that subsidence of an additional three feet may be expected over the next 5 to 15 years (p.74,83). Finally, they regarded navigation as incidental, insisted that pumps were necessary, and recommended additional canals and levees.

Like other engineers before them, the Board of Review believed that their plan would drain the Everglades. Although they called for "progressive drainage" (p.84), they never outlined which areas should be developed when. In short, they produced exactly what Governor Martin wanted--a document produced by engineering experts that appeared to justify his $20 million bond proposal. The public would again be reassured that Everglades drainage was just around the corner.

Nearly two decades earlier, government engineers Charles Elliott and Arthur Morgan disagreed with James Wright's plan for draining the Everglades. In 1927, conflict again broke out between engineers concerning the Glades. Arthur Morgan had long since left Washington to begin his own consulting firm in Dayton, Ohio, and, although he did not play a leading role in Everglades engineering problems, he kept posted on the issue.

On 1 August 1927, Morgan wrote Anson Marston of the Everglades Engineering Board of Review. "We have been asked to give our opinion of the Florida Everglades situation, and of your report, and we find ourselves in a very embarrassing situation" (Arthur E. Morgan, Personal and Public Papers). Morgan began by attacking the work of the Randolph Commission, insisting that "it was evident that they were the kind of men who would be appointed, not primarily for engineering counsel, but to approve a policy." He then argued that George B. Hills (along with Marston, a member of the 1927 Board of Review) admitted that Florida's chief drainage engineer was little more than a construction superintendent. Apparently Hills confided in Morgan "that the Everglades Drainage Board, dominated by the Governor, would have conferences or hearings with people from various parts of the district, and that the work was done where the pressure or influence was greatest, and regardless of any comprehensive plan." Yet Marston, McCrory, and Hills contended in their review of reclamation work up to 1927, that the work had been done "economically and efficiently."

Morgan noted that while in Tallahassee, he spoke with Governor Martin who "made sport" of engineers because they never seemed to agree. Incensed, Morgan scolded Marston. "Your report, in approving and recommending publicly the policies of the Drainage Board {in Tallahassee}, when privately your members had denounced those identical policies to me as the main cause of waste and mismanagement, gives the Governor just the ammunition he needs when other engineers differ from your report. He can repeat his contention that engineers cannot agree, and that therefor matters of policy must be left to practical men." Morgan also claimed that Governor Martin "emphatically said that there was no problem {in the Glades} except getting the money." On the contrary, Morgan believed money was not the only problem--that proper economic and administrative policies would almost inevitably lead to sound engineering design.

Marston limply replied on 10 August that his Board of Review did the best it could given the mood of the Florida legislature, and that he disagreed with Morgan anyway. Furthermore, Marston made clear that, in spite of the Board of Review's written instructions to study all aspects of the reclamation project (including policy and financing issues), Governor Martin told the engineers to refrain from addressing matters of policy and finance. On 19 August, Morgan chided Marston for not doing what he could have done to change the mood of the legislature. "For twenty years the Everglades project has floundered in mismanagement and inefficiency. You kept yourselves in a technically safe position, and the big job is not yet done."

Perhaps suspecting that Marston and his colleagues simply rubber-stamped the state's drainage policies, the Dade Drainage District (one of many smaller drainage districts within the EDD) asked for Arthur Morgan's opinion of their report. Morgan responded with a scathing review in October 1927. He began by explaining that "if money is hard to secure, or if unusual terms must be offered, it is almost conclusive evidence that the development is unsound, or that its management is bad" (p.3). As far as Morgan was concerned, the previous 20 years of failure in the Everglades was no accident--it was the logical outcome of bad laws and bad policies. He blasted the legislature for passing a $20 million bond issue even before the 1927 Board of Review had submitted its report, and added that in any event, an engineering report is hardly a plan for reclamation.

Morgan then attacked laws governing the Everglades Drainage District. "They are about the most primitive, unfair and inadequate of all the reclamation laws now in use in America" (p.4). Referring to the fact that the Florida legislature responded to constitutional objections to its 1905 drainage law by passing a slightly improved version in 1907, Morgan added "the fact that a law is constitutional does not necessarily mean that it is suitable" (p.4). One of his most strenuous objections was that under the existing system, a tract of land may be taxed for construction that is too far away to be of any benefit. "The land owners, who pay the bills, have no control over the operation and maintenance of these works, and no hearing on the assessments which are fixed by the legislature" (p.7).

Morgan (p.7) assailed the 1913 Randolph Commission report as "inadequate, unsound and inefficient," and noted that Everglades drainage had consistently been promised at a ridiculously low cost. The state may have authorized a $20 million bond issue, but Morgan estimated that reclamation would cost over $100 million. He believed that because Marston and his colleagues were told not to consider economic and administrative policies in their report, they did nothing more than recommend a continuance of the same policies which had been the chief cause of mismanagement and inefficiency up to this time (p.12). Like the Randolph Commission, the 1927 Board of Review advocated progressive drainage--and then proceeded to recommend a series of structures designed to reclaim all of the wetlands at once! "A sudden large extension of this canal system would doubtless increase the measure of benefit derived from it, but such a program would require a huge investment, the returns from which may be so long deferred as to place a confiscatory tax on the lands" (p.16).

Morgan prophetically concluded that if the same level of statesmanship and management continued to prevail, the troubles of the Everglades were only beginning. Yet he maintained his belief (first expressed in 1912) that the Everglades could and should be drained. "With sound and intelligently devised policies in control, an accurate technical analysis of the physical engineering factors would almost inevitably follow as a matter of course. With crude and unsound policies in control, no precision of engineering analysis can save the situation" (p.23).

Meanwhile, Lawrence Will (1961 p.101) observed that Lake Okeechobee was at its lowest level ever recorded on 1 August 1928. A month and a half of torrential rains raised the lake several feet--and then a hurricane struck. Although there is no accurate record of the storm's rainfall at Belle Glade, Ft. Lauderdale and Miami recorded six and seven inches of rain, respectively, for 17 September 1928 (U.S. Department of Agriculture 1928). Fred Elliot (1929) observed that as the storm moved over South Florida, sustained winds of over 100 miles per hour "piled" water into the southeast corner of Lake

Okeechobee. When the flimsy dike around the lake collapsed, a wall of water swept across the landscape and more than 1,800 people were killed (most near Belle Glade; Figure 43). Lawrence Will (1961) contends that settlers blamed the state for the disaster, holding Elliot especially accountable. Elliot blamed God. News of the killer hurricane swept the nation and caused even more people to question Everglades reclamation.

R.H. Little survived the storm, despite the fact that his house was washed over a half mile from its foundation. He wrote Thomas Will on 14 July 1929 from Massachusetts. "I had never heard that you were expelled from the Glades. I wish I had been years ago--it would have saved me many dollars and many hard days work for both my dear wife and self." Thoroughly disgusted with South Florida, Little viewed his land as a liability rather than as an asset. He noted that a sugar company offered him $10 per acre for land that he paid $50 an acre for nearly 20 years prior. "When I have seen good industrious men along the lake shore go broke, as squatters without taxes and free as a rule from frost; what hope is there for the great bulk of the Glades away from the lake?" Little was lucky to have the means to leave the Glades. Will wrote Senator Fletcher on 18 October 1928 that many pioneers who survived the storm had no choice but to remain. Anna Anjima corroborates this notion in a 6 October 1929 letter to Will. After heavy rains caused more flooding (Belle Glade received nearly 16 inches of rain in September 1929; U.S. Department of Agriculture 1929), Anjima noted that "friends tell us to come out of a place like this." In desperation, she asked "where to?"

South Florida naturalists added their voices to the chorus that questioned Everglades development. In a speech before the American Forestry Association on 28

February 1929, David Fairchild, who worked as a botanist with the U.S. Plant Introduction Station in Miami, urged support for the proposed National Park in the southern Everglades. He rejected claims that the southern Glades could be inexpensively drained and farmed. Fairchild then addressed the region's rapidly disappearing plant and animal life. "When one speaks of natural beauties--beauties which the fortuitous forces of nature have taken thousands of years to create--'gone forever' are ugly words" (Fairchild 1929, p.12). What annoyed Fairchild more than anything else, however, was the idea that people could transform a landscape into something better. He worried that "this generation of humans, laboring under one of those great illusions such as have in the past devastated the world, will cut roads through every hammock, drain every mangrove swamp, burn up all the peat deposits, let the fires destroy all the pines and imagine that the hand of man can make a better looking world than has the hand of nature" (p.18).

The New York Botanical Garden's John K. Small, a frequent visitor to South Florida and the Everglades, pleaded his case for preservation in 1929. Like Fairchild, he expressed his disgust with the development community. "Various minds have conceived various schemes for the 'development' of the Everglades, or 'devilopment' as interpreted by some. Among these ideas 'drainage' and 'farming' have been prominent excuses for tampering with the Everglades, ravishing directly the 'Glades' and indirectly the whole of the southern part of the peninsula" (Small 1929a, p.86). In 1929, Small published a book entitled *From Eden to Sahara*, in which he claimed that drainage and burning had become such a fad in South Florida that the region would soon be unable to support the plant life that fed animals. "Florida is being drained and burned to such an extent that it will soon become a desert" (Small 1929b, p.48).

Perhaps Small was guilty of dramatizing South Florida's hydrologic problems, but his perspective is still valuable because it is based on over two decades of observation. The entire book is well illustrated with "before and after" photographs of selected places showing fire damage throughout the Glades. Small admitted that "it is true that constant change involving destruction is a natural process as well as an artificial one. However, Nature's method is relatively slow and, as a rule, orderly, and results are usually finished--constructive--and satisfactory, while man's methods are crude and rapid, and result in great disorder" (p.112).

Finally, in a 10 November 1930 letter to Howard A. Kelly, Charles T. Simpson again spoke in favor of Everglades preservation (Kelly 1931, p.41). "Already a large amount of capital and effort have been wasted in trying to raise something in the Everglades and a colossal fortune has been expended in trying to drain them. So far as I can see and learn, very little success has been achieved in raising anything there and the effort at drainage is so far a failure." Like Small, Simpson noted the damage done by fire over the last two decades. "Year after year we here, at and near Miami, have been almost smothered in the dry season . . . by clouds of acrid, black smoke from the burning Glades." Simpson challenged the notion that the U.S. needed to open additional agricultural land, and asked "why must we wantonly destroy every vestige of natural beauty that a beneficent Creator has bestowed upon the earth?"

It appears that many Floridians lacked interest in Everglades reclamation. Palatka resident and absentee Glades landowner Sadie M. Petty wrote Will on 31 October 1928. "Think your idea of development is fine if only you can interest enough people on that subject." She added that times were hard and had been for several months. In conclusion, Petty observed that "{I} do not know any one right now interested in the Everglades." On 11 October 1930, B.R. Kessler of the Ft. Pierce Chamber of Commerce expressed his lack of confidence in the Glades. "We feel that the present system of draining the Everglades will not be satisfactory, and are afraid that we may again have a disaster such as that of 1928." Even Will's lower east coast friend George Bensel admitted on 22 October 1930 that "sometimes I feel despondent myself and wonder whether, after all these years, the thing {Everglades drainage} is going to result in a complete flop."

Indeed, there is some fragmentary evidence that suggests many Floridians opposed Everglades reclamation during the 1920s because many of the region's land owners were from up north. Pioneer settler Lawrence Will (1964) conceded that during the early 20th century, most fisherman, hunters, and cattlemen in South Florida were southerners including native Floridians. Northerners, on the other hand, came to the Glades to farm. According to Will (1964 p.5), "sawgrass farmers called the cow men and hunters 'Ignorant Crackers' while the natives considered the northern men as 'Dumb City Dudes' who thought they could make a living farming in the Everglades. I reckon neither one was wrong." Will believed that native Floridians did not mind Yankee tourists, but they did not want northerners moving down, settling, and voting (Will 1961 p.102). "Then, too," Will added, "most native Floridians were honestly convinced that the Everglades was never intended for human habitation, and could never satisfactorily be reclaimed" (Will 1961 p.104).

It is possible that Lawrence Will's view came from his father, Thomas Will. By late 1923, the elder Will believed that politically powerful north Floridians resented migrants from the north. He detailed these thoughts in a 4 January 1924 letter to Alvin G. Whitney, the Syracuse University professor. “I am at last convinced, and my belief is confirmed by Florida people who have been here all their lives, that an Up-State political ring, representing the ‘Old South,’ and hostile to this Yankee invasion, has purposefully obstructed the reclamation and settlement of the Everglades, lest the inrush of these thousands of ‘carpet-baggers’ vote them out, and ‘run things’ themselves.”

Even before the hurricanes of 1926 and 1928, pioneer settler Victor Roth complained to Idaho Congressman Burton L. French in a letter dated 2 September 1926 (Thomas E. Will, Personal and Public Papers). Speaking for pioneers throughout the lake shore region, Roth charged “the state and county of Palm Beach of a conspiracy to defraud these thousands from north of the Mason & Dixon line who showed their faith in the agricultural possibilities of these swamp lands by investing some of their modest means in ten and twenty acre units under the promise of early drainage and means of transportation.” Like Will, Roth accused “southern minded” politicians of deliberately attempting to keep northerners out of Florida. If this was true, Florida politicians completely failed; northerners poured into all of South Florida, including the Everglades (Lamme and Meindl, in preparation).

North Floridians may or may not have been guilty of deliberately trying to keep Yankees out of the Sunshine State, but it is probably fair to suggest that they were less than eager to see South Florida prosper. Florida’s legislature repeatedly refused to make any appropriation for Everglades drainage. Reclamation expenses were paid from the sale of state-owned swamp land, almost all of which was in the Glades, and from taxes levied on land in the Everglades Drainage District. This fact became the center of a heated exchange between Florida's Attorney General, Frederick H. Davis, and members of the House Committee on Flood Control (U.S. House 1929). Davis went to Washington shortly after the 1928 hurricane to ask the federal government to foot the bill for a dike around the southern end of Lake Okeechobee. Davis argued that since the federal government (through the U.S. Army Corps of Engineers) insisted that Lake Okeechobee's water level be kept high enough to support navigation, the federal government should pay the entire cost of flood control. Congressmen repeatedly asked Davis what the State of Florida might be expected to contribute to such an endeavor. Finally, the Attorney General announced that he would not object if the state contributed to flood control in South Florida. "But you must remember," he continued "a vast number of the people that come down into this particular territory are people who come from other States and settle in this territory, and it is mighty hard to get people in other parts of the State interested in whether they perish or not" (U.S. House 1929, p.145). Furthermore, Davis claimed that many people in Florida wanted to build a wall in South Florida and use the military to keep people out. "You have to contend with that feeling in some portions of the State that the best thing to do is to stay out of that territory" (U.S. House 1929, p.146).

For their part, northerners themselves were rapidly losing faith in the Glades. In R.H. Little's 14 July 1929 letter to Thomas Will, he noted that "I have never met any person in the North yet that has a good word to say about Florida except for its winter climate." H.S. Howard of Watkins Glen, New York, told Will on 5 January 1929: "to tell the truth I am in doubt about continuing this outlay {paying taxes}." Will received more bad news two weeks later when Cincinnati real estate man William B. Poland sent him a letter dated 17 January. “Just between ourselves, I am afraid my friends interested in the 42,000 acres of Everglade land are ‘fed up’ on Florida.” C.L. May, a dentist from Minneapolis, confessed to Will on 22 May 1930 that he had to sell his ten acres in the Glades because the taxes were becoming a burden. “I paid $240 for the original tract . . . and have paid several hundred dollars in taxes since. I do not like to lose this sum but I simply can not afford to hold same.” He sold his property for $150. Finally, C.E. Leach of Fairbury, Nebraska wrote Will on 30 June 1930. He tried to lease his land to anybody who would just pay the taxes but he found that nobody was interested. “It seems as tho if it does not look good enough to those down there to be worth the taxes . . . a man is simply throwing good money after bad to put more into it.” He believed that if no one would lease his land under those generous terms, then he and other northerners were “suckers to pour more money into the pockets of Florida politicians.”

After more than two decades of effort, the Everglades remained far from the earthly paradise people like Thomas Will thought they could be. Poor transportation, frequent fires, and killer hurricanes plagued the region. Furthermore, agronomist E.R. Lloyd (U.S. Senate 1930, p.5) reported that “it is an established fact that these peat soils when freshly broken proved disastrously toxic to practically all plants that have been tried upon them with the exception of the potato.” Finally, unlike the 1910s, there were several episodes of severe flooding during the 1920s. Indeed, excessive precipitation in 1920 forced Thomas Will to abandon his home in Okeelanta. Heavy flooding during 1922 postponed construction of the agricultural experiment station at Belle Glade until 1923. At the end of the rainy season in 1924, Belle Glade received nearly 16 inches of rainfall during October--nearly twice the mean for that month at that location. Of course, the hurricanes of 1926 and 1928 caused substantial flooding in addition to untold property damage and loss of life. Confidence in Everglades reclamation plummeted further still.

While population in the Glades increased from less than 2,500 in 1920 to over 10,000 ten years later, the 1930 census reveals an increasing concentration of population around Lake Okeechobee (U.S. Department of Commerce 1932; Figure 43). Precincts of Pahokee, Canal Point, Clewiston had 2735, 2509, and 2284 people respectively. The precincts of Belle Glade and Chosen had a combined total of 1743 people in 1930. Meanwhile, the precinct originally located at Okeelanta shifted closer to the lake at South Bay where 754 people were counted in 1930. Further away from Lake Okeechobee, the precinct centered at Shawno (location of the Brown Company farm) had but 205 residents and Gladeview was down to just 11 people in 1930 (U.S. Department of Commerce 1932).

In spite of all the problems, a small number of people insisted that the Glades could be transformed into profitable farms. Lloyd (U.S. Senate 1930, p.15) maintained that "the large operators as well as the small with whom I had conferences have an abiding faith in the future development of the Everglades. This faith is abundantly proven by the permanent improvements, machinery, and equipment found on the farms." Lloyd apparently looked with favor upon such development, practically repeating the claims made by countless Everglades boosters in previous decades. "The low cost of preparing and cultivating these lands, the plentiful latent plant food contained in them, and the large yields per acre make these lands very valuable for agricultural purposes" (p.15).

Summary

After nearly two decades of attempted settlement, most of the Everglades remained uninhabited. Almost all of the region's people lived along Lake Okeechobee. In an 18 November 1931 circular letter to "Old Everglades Buyers," Thomas Will conceded that "the saw grass country lies prostrate." Storms, floods, frosts, and a host of agricultural problems prevented the Glades from being developed. It is convenient to end this study in 1930. For one thing, hurricanes in 1926 and 1928 caused tremendous loss of life and property. Furthermore, the Everglades Drainage District declared bankruptcy on New Year's Day 1931. As a result, no additional reclamation work of any significance would be done until 1949 (DeGrove 1984).

CHAPTER 6
ABSTRACT IDEAS ASSOCIATED WITH THE GREAT AMERICAN WETLAND

As indicated earlier (Chapter 2, p.38), Prince's third realm of historical geographic inquiry is that of an abstract view of past places. Specifically, some historical geographers develop theories or models in an effort to explain human geographic activity in the past. Model construction is a difficult task, especially in historical geography. Yet if successful, a model might make it possible to more fully understand what would otherwise appear to be chaotic patterns of activity sprinkled across the landscape. For example, Peirce Lewis (1990) suggests that both New England and Pennsylvania are cultural hearths whose influence can be felt far into the West and Midwest. According to Lewis (p.81) "what began as a congeries of rather peculiar regional quirks was carried westward and ultimately stamped as standard patterns of human geography across an enormous part of the American nation." In other words, if one is armed with a reasonable understanding of geographic patterns in one place, one might be able to explain geographic patterns elsewhere.

Are past perceptions of the Everglades unique? Is there be any connection between late 19th and early 20th century views of the Glades and other wetlands? There is ample evidence to suggest that the Everglades were historically viewed as most other wetlands. Historical geographers have painted somewhat similar pictures of wetlands in the Midwest (Winsor 1987; Kaatz 1955; Meyer 1935). Are there any other connections?

Perhaps shortly after the turn of the century, wetlands became viewed as a fertile class of "flatlands," and because wetlands were (and still are) frequently the only undeveloped land in an area (Ewel 1990), this made them especially vulnerable to development pressure. On one hand, mountainous areas are clearly vulnerable to development pressure because development can cause severe soil erosion. On the other hand, the threat to wetlands and many other flatlands is more subtle--and this causes people to overlook their vulnerability to development pressure.

The Everglades and other wetlands were not the only shunned flatlands in the United States prior to the turn of the century. Americans often held arid lands in equally low regard. In an effort to make arid flatlands more productive, the U.S. created a Bureau of Reclamation in 1902 (Rowley 1996). Although this bureau concentrated its efforts in the desert southwest, pioneers were in the process of settling another flatland region: the Great Plains, or what was briefly known as the Great American Desert. Although the Plains are quite different from the Everglades, there are many perceptual similarities between the old Great American Desert and the Great American Wetland. These similarities can be placed into three broad categories that describe major perceptual themes germane to both regions--and perhaps to all flatlands.

Large, relatively open, flatlands were initially viewed as strange places, but as other more desirable places became occupied, flatlands also became more desirable. The concept of settlement potential has been routinely ignored, especially by those who are able profit the most from flatland settlement. Finally, in cases where it has become clear that such development would fail without substantial support, the federal government has been called upon to help fund flatland development.

Theme #1: The Plains and the Glades as Strange Places

Both the Plains and the Glades have suffered from the impression that these landscapes are not only undramatic, they are also undesirable. Lewis (1962) contends that during the first 150 years of sporadic exploration by European explorers, Plains descriptions varied from desert to useless grassland. Not until well into the 19th century did significant numbers of people begin to view the region as an area of immense potential. Ignorance of the Everglades among early Europeans is just as apparent. According to Teabeau (1974 p.1), "the Spanish era produced very little knowledge of South Florida and almost none of the interior." Knowledge of the Glades improved little even after Florida became part of the United States in 1821. Captain John LeConte of the U.S. Topographical Engineers investigated South Florida in the early 1820s and rejected the existence of Lake Okeechobee despite its presence on previous maps (Tebeau 1974). As indicated earlier, even though much was discovered about the Everglades when the U.S. Army fought and removed most of the Seminole Indians from the region during the 1830s and 1840s, interest in the Glades remained weak until the 20th century.

Furthermore, both places have been described as "seas of grass." Early Glades pioneer Thomas Will's papers are replete with references to the region as an ocean of tall sawgrass. The historic tall grasses of the Plains are perhaps not as widely recognized, but they too have been called a sea of grass (Milton 1982). Yet contrary to popular perceptions of the seemingly endless stretches of grass, there is landscape variation in both the Plains and the Glades. Much of the problem revolves around people's sense of scale. Most European colonists to North America came from places with hills or mountains. As they settled North America's eastern seaboard, they found somewhat familiar topography. When the wave of settlement reached Florida and central North America, however, pioneers encountered substantially different landscapes. In these regions, changes in relief are much less noticeable. Furthermore, relatively slow transportation prevented many 19th and early 20th century travelers and pioneers from observing topographic differences over large areas. In short, flatlands were originally viewed as monotonous and undesirable places.

Theme #2: Settlement Potential in the Plains and Glades

As European and African Americans replaced Native Americans in eastern North America's fertile valleys and other desirable places, perceptions of the once shunned flatlands further west suddenly improved. Moreover, perceptions of wetlands began to improve after 1898 when it was discovered that mosquitoes transmitted malaria (Oaks et al. 1991). After it became clear that wetlands did not yield malaria-producing air, these environments became viewed as valuable additions to the nation's rapidly dwindling stock of unoccupied flatlands. Accordingly, during the late 19th and early 20th centuries, the Great Plains and Everglades became viewed as places of immense settlement potential. In this case, settlement potential refers to a region's ability to sustain a certain number of people at an acceptable standard of living. Prince (1995 p.18) argues that during this time, "a ladder of progress ascended from destructive exploitation of natural resources to continuous cultivation of crops by permanent settlers." Indeed, Watson (1976 p.71) notes that "development in America had almost become synonymous with ravagement. Love of country had become rape of the land." Examples of this attitude are not hard to find.

On the Plains, Stevens (1993) reports that over 90% of this nation's tallgrass prairie has vanished under the plow and bulldozer, and most of the rest is so fragmented and degraded that it scarcely resembles its former self. It is widely recognized that Plains bison were hunted to the brink of extinction. In the Everglades, some plumage producing birds nearly met the same fate. Although alligators were not severely threatened, they might have been if not for the protection granted under laws like the Endangered Species Act of the early 1970s. Lamar Johnson (1974 p.113) remembered surveying in the Glades during the early 1920s: "the alligators afforded us sport in capture and made an attractive target for needless killing. I regret that now, but it did not seem important then."

Both the Plains and the Glades have had noteworthy personalities who served as "ambassadors" or "caretakers" for their respective regions. Few people did more to publicize the differences between the humid eastern U.S. and the relatively arid western states than John Wesley Powell (1878). He insisted that past perceptions of land use were inappropriate for the dry west--including the Plains. Powell recognized the limited settlement potential of more arid regions. Although Powell spent much of the later 19th century promoting Plains settlement, he called for more limited development, contending that the region simply could not support the same population densities found in the eastern states.

Similarly, one could scarcely discuss the Everglades without mentioning Marjory Stoneman Douglas. Ever since she wrote *The Everglades: River of Grass* in 1947, Douglas has been a tireless advocate of Everglades preservation. As Yates (1983 p.113) contends, for more than half a century Douglas has articulated "the value of the area to the

Biscayne Aquifer and to Everglades National Park wildlife; of how it was by nature a periodically flooded wetland, not a place for housing; and how the state could not afford to drain our last invaluable wetlands at taxpayer expense for houses that would surely need further protection from storm floods. . . ."

Yet unscrupulous land sellers lured countless people into extremely difficult conditions in both the western Plains and the Everglades. In South Florida, Thomas E. Will devoted the last 28 years of his life to Everglades promotion and development (Dovell 1947). His son Lawrence (1968) was proud that he and other early Glades settlers overcame the hardships of life in South Florida's interior. As for the Plains, Baltensperger (1992 p.60) believes that the "Great American Desert myth was nothing more than a promotional ploy to encourage the settlement of the central Great Plains." He adds that the myth was created by Plains boosters as a challenge to hearty pioneers to "conquer" the difficult environment of the central U.S. John Hudson (1992 p.24) appears to agree, observing that "'Free land in the West,' a rallying cry for many in the mid-nineteenth century, was a boon to settlement on the fringes of the Middle West not yet reached by the westward-moving tide of land-seekers."

In neither case was there any recognition that these environments are not able to sustain the large population densities found in other environments. Yet Sonnenfeld (1978 p.21) concludes that "even when resources are obviously being depleted . . . there is often still lacking the sense of an option to conserve resources if this means a reduction in standard of living or social well being." To this could be added the idea that European-Americans have historically demanded the opportunity to extract wealth from land, regardless of costs--especially costs they can force society to pay (Barkley and Seckler 1972). As a result, pioneers poured into both the Plains and Glades hoping to make a living. Since small landowners could not afford the costs of farming, they eventually sold their land to larger landowners with access to more capital and political influence.

Both of these regions provide much fodder for those who argue for more sustainable development. Frank and Deborah Popper (1991) contend that declining populations in many western and Plains counties is evidence that the region cannot support existing residents; in other words, the Plains may have exceeded their settlement potential. Wallach (1985) agrees, suggesting that the federal government should ease residents out of the region by purchasing their land. Recent popular concern over the fate of the Everglades suggests that limits to South Florida's settlement potential may also have been reached. Much of the recent commotion surrounding the sustainability concept, however, stems from the fact that we still do not know how much pressure an environmental system can withstand before collapsing.

Theme #3: Federal Government Land Policy in the Plains and Glades

Both the Great Plains and the Everglades received substantial attention from the federal government during the 20th century. Much of this attention has been in the form of agricultural subsidies (direct and indirect) to farmers in both the Plains and the Glades. Indeed, many grain farmers in the Plains have grown dependent upon price supports for their produce. Frank and Deborah Popper (1987) argue that not only have harsh natural and economic conditions already begun to depopulate the region, they insist that it is becoming too expensive to continue subsidizing settlement in the Great Plains. Gilbert Fite (1979 p.197) adds that “there is no doubt but that the flow of federal money into the Great Plains has kept the region’s income considerably above what it would have been otherwise.” At the same time, South Florida sugar growers receive indirect subsidies as well as a foreign policy which prevents less expensive, foreign sugar from entering the United States. In fact, Florida Audubon Society president Clay Henderson distributed a letter dated 12 September 1995, urging members to support Congressional efforts to end price supports for sugar.

The federal government has invested heavily in public works projects for both the Plains and the Glades. Yet both regions have publicly-funded projects that have been denounced in recent years. Criticism of central North Dakota’s Garrison Diversion, a massive irrigation scheme, eventually became so intense that Congress cut off funding necessary to complete the project. In the Everglades, there are ongoing experiments to determine the feasibility of leveling dikes and filling ditches currently used in South Florida water management (Cohn 1994).

Although the federal government has supported development in both the Plains and Glades, it is important to recognize differences between these two regions. To begin with, the central U.S. is much larger than the Everglades. Moreover, the current embargo on Cuban sugar is a fundamentally different source of subsidization for South Florida farmers than the direct price supports given to Plains farmers. Finally, the Glades are rimmed by South Florida’s burgeoning urban population while the urban influence on the Plains is much less. Each of these factors (and others) has helped shape the relationship between the federal government and these two regions.

Summary

At first glance, it might appear as if there is no connection between the Great American Desert and the Great American Wetland. Yet it should be clear that these landscapes share much in common. Their relative flatness and apparent emptiness have historically created negative impressions in the minds of many people. Even today, despite improvements in transportation that allow one to examine much subtle variety across space, a generally negative perception of both the Plains and the Glades persists.

Furthermore, lack of relief may help generate the impression that these regions are so expansive that no amount of human pressure could hurt them. In both the Great Plains and the Everglades, perhaps relative flatness and expansiveness lured people to overdevelop each of these regions, bringing each to the brink of environmental disaster. Recent suggestions by the Poppers to return the Plains to a "Buffalo Commons," along with current fear of environmental collapse in South Florida are certainly not universally accepted--but they are symbolic of the notion that humanity must learn much more about these strange and unfamiliar landscapes.

It would also appear that the federal government has devoted a substantial amount of resources to these regions. Although other places in the U.S. have attracted many federal dollars (urban renewal programs, Tennessee Valley Authority, and Florida's "Space Coast"), there appears to be clear recognition that substantial sums of money devoted to the Glades and Plains have been used for ill-advised purposes. Continuing debate over agricultural subsidies, failure to complete the Garrison Diversion project, and plans to return part of the Glades to its natural state indicate as much.

The Great American Wetland has much in common with the Great American Desert after all. The fact that each region is relatively flat with only subtle changes in relief led American settlers to develop negative perceptions of the Plains and Glades. A land hungry-population eventually spilled into both regions, and population pressure eventually produced environmental problems prompting pleas for government intervention. Environmental stress is not due to any single cause--but occurs as a result of a complicated interaction between economic, political, and technological factors (as well as our responses to physical factors)--and these factors are a consequence of our attitudes and values.

One might extend the same analysis to flatlands across the United States. Almost all of the nation's major urban centers are located on flat terrain. Drainage and irrigation have rendered almost all rural flatlands--wet or arid--vulnerable to agricultural development. In this respect, the Everglades are not unique at all. After it was *suggested* (not proven) that the Glades could be drained, they were viewed as any other flatlands and subjected to intense development pressure.

Furthermore, promoters and politicians routinely ignored evidence that suggested caution and that the cost of reclaiming the Everglades would be prohibitive. They passionately believed in James Wright's error-laden report that eventually made its way into *Senate Document 89*, while ignoring the more sober judgement of soil experts in their 1915 report. Then during the 1920s, muck fires raged out of control, soil subsidence caused water in the main canals to flow toward Lake Okeechobee, and severe flooding continued to plague the region. In 1926 and 1928, devastating hurricanes swept through

South Florida. Although development in the region slowed to a snail's pace after the storms, Florida called upon the federal government to help prevent the region from returning to wilderness.

Why? Because landowners maintained an unshakable belief in their right and power to convert the landscape into wealth. The Everglades were the perfect flatland, and flatlands have always been much easier to develop than areas with relief. Since the late 19th century, the lure of flatlands in the U.S. has led people to ignore possible consequences associated with their development. Seen in this light, early 20th century perceptions of the Everglades suggest that many flatlands are vulnerable to development pressure.

CHAPTER 7
SUMMARY AND CONCLUSIONS

This has been an examination of turn-of-the-century historical geography in the Great American Wetland--South Florida's Everglades. Analysis of the Glades has been divided into three parts. First, an attempt has been made to reconstruct the region's turn-of-the-century physical geography. Next, and most important in this study, is an examination of people's perceptions of the Everglades from the 1890s to 1930. Finally, an effort has been made to view the Glades in abstract fashion; specifically, to see if there are any connections between the Great American Wetland and other places.

Several points can be made regarding the region's physical geography. To begin with, although people at the turn of the century understood that Lake Okeechobee contributed flood waters to the Glades by periodically overflowing its southern banks, not until 1913 did they acknowledge the significance of Kissimmee River runoff into the lake. Furthermore, although people of the time correctly recognized the organic nature of the region's soils, many incorrectly believed that South Florida's organic soils were uniformly fertile. Moreover, they failed to grasp the causes and significance of soil subsidence. Finally, many people misunderstood South Florida's climate. Most writers appeared to comprehend the region's annual cycle of wet season followed by dry. Yet many failed to give proper attention to the impact of tropical storms or the annual variation in precipitation that these storms caused. It would also appear that most viewed South Florida as a truly tropical place, ignoring the region's potential for occasional frost.

The bulk of the dissertation deals with people's perceptions of the Everglades from the 1890s to 1930. Few people paid much attention to the Glades or any other part of South Florida until Henry Flagler's railroad reached Miami in 1896. Even then, the Glades were viewed by most as just another useless wetland. Occasionally, railroad representatives or other members of society's elite suggested that the Glades were full of potential--as well as snakes and alligators. Yet few people viewed the Glades in positive light until Governor Napoleon B. Broward began drainage operations in 1906. Even then, there remained plenty of opposition to Broward's plan; not so much because people did not believe in draining wetlands, but because they challenged the notion that draining the Glades would be a simple and inexpensive proposition. It must be kept in mind that Broward and his supporters pushed Everglades reclamation at the same time the rest of frontier South Florida began its development.

"Everglades fever" spread across the United States between 1909 and 1912 as Florida sold large blocks of South Florida's wetlands to land companies who engaged in a tremendous effort to resell these lands to the public for profit. Although the Glades finally attracted much interest, land companies were guilty of creating the impression that the region was soon to become a poor man's paradise--and Florida's officials allowed and even encouraged such impressions. People from across the northern U.S. trickled into South Florida's interior and began pioneering. Because the region had been ignored for so long, however, nobody really understood the Everglades. Hence reclamation did not proceed according to plan. Early Glades settlers endured tremendous hardships and many were forced to leave. Still, others moved south throughout the 1910s, ignoring the USDA's 1915 soil survey of the region and pretending that the Randolph Commission would solve all remaining engineering difficulties. As taxes rose without apparent result or end, so did discontent. Everglades landowners began to lose faith in their investment, and most residents of Florida's lower east coast were too busy developing their own section to worry about the Everglades. The rest of Florida maintained an ambivalent attitude regarding the Glades: the state legislature did not dare make appropriations for drainage operations, but state politicians authorized the sale of bonds in order to continue the project.

The first half of the 1920s were characterized by alternating years of disastrous flooding for Everglades farmers. Many pioneers became discouraged, northern based landowners quit paying taxes, and the financial community began to view the Glades as an unacceptable risk. Adding insult to injury, southeast Florida enjoyed a land boom that practically eliminated any remaining interest in its hinterland. Still, a handful of believers refused to accept defeat.

During the late 1920s, yet another group of engineers prepared a report stating their belief that the Glades could be reclaimed. Then hurricanes swept through the region in 1926 and again in 1928, with much corresponding loss of life and property. Some accused the state of mismanaging Everglades reclamation while others blamed the federal government for insisting upon relatively high water levels (for navigation) in Lake Okeechobee. By 1930, South Florida and the Everglades had become closely associated with people from up north. As a result, most central and north Floridians could not have cared less about Everglades development.

Viewed more abstractly, the Everglades are not just wetlands, they are also flatlands; and flatlands (wet or dry) are particularly vulnerable to development pressure because it is difficult for people to perceive such subtle vulnerability. Flatland expansiveness suggested an almost unlimited capability and that no amount of pressure could harm them. After initially being viewed as strange and undesirable places, flatlands became sought-after because people perceived that they could easily be developed. Even when seemingly insurmountable problems appeared, promoters turned to the federal government for help.

Can any conclusions be drawn from such a study? To begin with, it seems clear that many early 20th century people questioned Everglades reclamation. This is not to say that these people were concerned with the Glades' ecological health. They did not question the desireablility of draining the Glades. Yet it seems safe to argue that many people of that time doubted the State's reclamation effort. This is contrary to the current popular notion that most early 20th century people supported Florida's efforts to drain the Everglades. This being true, the following question begs an answer: if there were so many problems and so many people questioned the state's drainage program, why was it not stopped? After all, when Florida appealed to the federal government to help build a dike around Lake Okeechobee, they were initially rebuffed.

It would appear that people's perceptions of the Glades are the result of a complex interaction between facts, beliefs, and values. Facts regarding places like the Everglades are characteristics that can be verified. During the late 19th and early 20th centuries, most people had a relatively poor understanding of the facts about the Everglades. Since nobody understood the facts, it was easy for large landowners in South Florida to substitute their beliefs about wetlands (and hence the Glades) for the facts. This also reflects the stake of large landowners in the Everglades--who quickly became land sellers. What about the engineering community? What led James Wright to believe that the Glades could be quickly and inexpensively drained? He too had a stake in Everglades drainage because he achieved almost instant notoriety as the engineer responsible for the reclamation project.

Yet such an explanation does not account for how otherwise intelligent people allowed other people's beliefs about the Glades to shape their beliefs about South Florida's interior. The missing link is that people's *values* modify their beliefs about the facts. One of the most striking values of many people during the late 19th and early 20th centuries was that of making "wasteland" productive. Wetlands were considered useless. Facts about the functions of wetlands (such as flood control, water quality improvement, groundwater recharge, and others) remained to be discovered and broadcast. Relative ignorance of the facts about wetlands allowed most people's values regarding land use to modify their beliefs about the Everglades. Therefore, even when early Glades pioneers confronted substantial difficulties, their values concerning wastelands altered their beliefs about the problems they faced. Only after repeated confrontation with the facts (reality) did many people eventually shift their beliefs about the Glades into closer accord with the facts.

Accordingly, future research should be conducted on people's perceptions of the Glades from 1930 to the 1990s. It should be possible to interview many people who participated in the continued development of South Florida's interior. Such research might reveal how such an unpopular disaster could be continued. Perhaps there were enough powerful people who stood to profit from Everglades development to convince the federal government to support the work. It appears that the Everglades became for Florida officials what the Vietnam War became for the U.S. government: the venture no chief executive wanted to be blamed for losing.

Moreover, it has been suggested that those with a stake in Everglades development were most likely to support reclamation. This hypothesis can be explored by examining representatives of several different groups of people regarding their views of the Glades. How do today's Native Americans view the Glades? What about perceptions of South Florida's urban poor, the region's real estate community, children, local politicians, and other groups? Such research might clarify who supports continued development in the Everglades and why.

Many Floridians are anxious to blame farmers for problems in the Glades, and agricultural activities are certainly to blame for some of the Everglades' problems. Yet the current "farmers versus environmentalists" debate seems shallow and unproductive because urban expansion into the Glades is not addressed. Rampant urban development not only converts the Glades into housing and commercial areas, it also places increasing stress on the Biscayne Aquifer--South Florida's chief source of drinking water. Future research should be aimed at documenting the effects of urban expansion into the Glades and comparing this with people's perceptions of such effects.

Finally, there appears to be a void in our knowledge of people's perceptions of flatlands. Are they really as vulnerable as has been suggested in this study? Additional studies of other flatlands such as the region between Phoenix and Tucson, Arizona, California's Central Valley, or the southeast's Coastal Plain might provide a more conclusive answer. Such research might also guide environmental policy makers as they make decisions regarding flatlands.

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BIOGRAPHICAL SKETCH

A native Floridian, Chris was born in Tampa (1961) and raised in Melbourne Beach, Florida. After graduating from Florida Southern College in 1983, he taught history at Melbourne Central Catholic high school before moving to San Diego, California, in 1984. Chris worked part-time while taking graduate courses in history from San Diego State University, eventually earning a master's degree in history. Four years later, he moved back to Florida, teaching high school economics in Kissimmee for two years. Upon enlisting in the National Guard, Chris spent the summer of 1990 attending army boot-camp at Ft. Benning in Columbus, Georgia. From 1990 to 1992, he attended the University of North Dakota where he worked as a baseball coach and teaching assistant in the department of geography, eventually completing a master's degree in geography. While working on the Ph.D. in geography at the University of Florida (1992-1996), Chris met and married his wonderful wife Kathleen.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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This dissertation was submitted to the Graduate Faculty of the Department of Geography in the College of Liberal Arts and Sciences and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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